DISSERTATION ON

PRE – INDUCTION TRANSVAGINAL SONOGRAPHIC MEASUREMENT OF CERVICAL LENGTH IN THE PREDICTION OF SUCCESSFUL INDUCTION OF LABOUR

Dissertation submitted
in partial fulfillment of the regulations
For the award of the degree of

M.S. DEGREE - BRANCH - VI

OBSTETRICS AND GYNAECOLOGY

Of

THE TAMIL NADU
DR. M.G.R. MEDICAL UNIVERSITY

ESI MEDICAL COLLEGE &
POSTGRADUATE INSTITUTE OF MEDICAL SCIENCES AND RESEARCH
KK NAGAR

APRIL - 2014

CERTIFICATE

This to certify that this dissertation **"PRE – INDUCTION TRANSVAGINAL SONOGRAPHIC MEASUREMENT OF CERVICAL LENGTH IN THE PREDICTION OF SUCCESSFUL INDUCTION OF LABOUR"** submitted by **Dr.M.REKHA** appearing for M.S. Degree, Branch – VI, **OBSTERICS AND GYNAECOLOGY** examination in April 2014 is a bonafide record of work done by her under my direct guidance and supervision in partial fulfillment of the regulations of the Tamilnadu Dr.M.G.R. Medical University, Chennai, Tamilnadu, India.

PROFESSOR AND HOD
Co-Guide
ESI Medical College & PGIMSR,
KK NAGAR,
CHENNAI-78

ASSOCIATE PROFESSOR
Guide
ESI Medical College & PGIMSR,
KK NAGAR,
CHENNAI-78

DEAN

DECLARATION

I solemnly declare that this dissertation entitled **"PRE – INDUCTION TRANSVAGINAL SONOGRAPHIC MEASUREMENT OF CERVICAL LENGTH IN THE PREDICTION OF SUCCESSFUL INDUCTION OF LABOUR"** was done by me at ESI Medical College & PGIMSR, K.K Nagar, Chennai during 2012 - 2013 under the guidance and supervision of Professor **Dr.T.K.RENUKA DEVI, MD., DGO,** and Associate Professor **Dr.GOWRI, M.D., DGO,** This dissertation is submitted to the Tamil Nadu Dr. M.G.R. Medical University towards the partial fulfillment of requirements for the award of M.S. Degree in OBSTERICS AND GYNAECOLOGY (Branch - VI).

Place: Chennai-78.
Date

Signature of Candidate
Dr. M.REKHA
MS Post Graduate Student
Dept of Obstetrics & Gynaecology
ESI Medical College & PGIMSR
K.K.Nagar
Chennai

ACKNOWLEDGEMENT

In the first place I would like to convey my gratitude to our Dean. **Dr.SRIKUMARI DAMODARAM, M.Ch,** for providing me unflinching encouragement and support.

I would like to record my gratitude to my Professor **Dr.T.K.RENUKA DEVI M.D., DGO,** Head of Department of Obstetrics And Gynaecology, my mentor and my co – guide for her supervision, advice, and guidance from the very early stages of this study.

I would also like to thank **Dr.GOWRI, MD., DGO,** (O&G), Associate Professor and my guide, who had been instrumental in the completion of this study and for giving me moral support throughout the work.

I would like to thank **Dr.SWARNA, DMRD,** the Sonologist who guided me in measuring transvaginal cervical length.

Many thanks in particular to the **CHAIRMAN** and members of the Intuitional Ethical Committee for approving our study and for their valuable suggestions. I thank the statistician **Dr.VENKATESAN, Ph.D.,**

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

for his guidance regarding the sample size. I also thank Statistician **Mr.AASAITHAMBI** for his help in Data Analysis.

Of all, I would like to thank all the patients for their participation and cooperation.

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

ABSTRACT

OBJECTIVE:

Prediction of successful vaginal delivery by measuring transvaginal cervical length before induction.

STUDY DESIGN:

It is a prospective observational study done in 250 women with gestational age ranging from 37-42 weeks of gestation. Cervical length is measured before induction by trans-vaginal ultrasound. Both primi and multigravida are included in our study. Induction with PGE2 gel is done.

RESULTS

Results are analyzed with ROC curve, the cut-off value predicting successful vaginal delivery is 2.6cm with sensitivity of 97.4% and specificity of 97.8% within 72 hours of induction. Area under curve is 0.975.

CONCLUSION

Thus trans-vaginal cervical length measured before induction can be used to predict successful vaginal delivery. In future, the traditional method of assessing the favorability of cervix can be replaced by trans-vaginal cervical measurement and add yet another dimension in field of obstetrics.

CONTENTS

INTRODUCTION

Incidence of labour induction is 22.5% (Martin and associates) [1.] The commonest indication is prolonged pregnancy[2]. Numerous studies have shown that compared to expectant management induction is associated with reduction in perinatal mortality.

The prediction of successful vaginal delivery is based on favourability of cervix before induction and it's determined by Bishop's score[3-5]. But this assessment is subjective and studies have proved to have poor predictive value for induction outcome in women with low Bishop's score[6].

The use of trans-vaginal ultrasound has increasing application in the field of induction of labour in obstetrics. Trans-vaginal cervical length measurement used mainly to detect changes in cervix of women with risk of preterm delivery.

Theoretically trans-vaginal sonographic measurement of the cervix represents more accurate assessment of cervix than digital examination[7]. Here the supravaginal portion of cervix contributing to 50% of the total cervical length is difficult to assess digitally and also the assessment of the effacement which begins at the level of internal os is difficult to predict in closed cervix.

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

But sonographic measurement of the cervical length is easily reproducible method and it can be done easily with minimal discomfort to patient. This study was undertaken in the institute of ESIPGIMSR to determine the successful labour induction by measuring trans-vaginal cervical length.

Further trans-vaginal cervical length measurement in future can be used as an adjunct tool and add yet another dimension of information in the field of obstetrics.

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

AIM OF THE STUDY

Prediction of successful vaginal delivery by measuring trans – vaginal cervical length before induction.

REVIEW OF LITERATURE

(A) HISTORIC PROSPECTIVES OF PREDICTION OF SUCCESSFUL LABOUR INDUCTION BY PREINDUCTION SCORING

- Among the different cervical scoring systems described Bishop's scoring system (1964) is most commonly used.

- FFN (Foetal Fibronectin) concentrations are measured in the cervico-vaginal secretions. If <50 mcg/ml its favourable cervix and more chance of successful labour induction (Ekman et al., 1995). Shorter induction delivery interval with positive FFN than negative FFN. (Kiss et al 2000).

- Trans-vaginal cervical length measurement has been investigated as tool for prediction of outcome of induced labour and as an alternative to traditional Bishop's scoring system. Several studies have determined the relationship between cervical length, internal os changes and angle between cervical axis and inferior segment of uterus. (Chandra et al 2001)

- Electrical impedance measurements is done with 8 mm tetra polar pencil probe over surface of cervix to determine correlation of

cervix favourability with clinical examination.(O'Connell et al. 2003)[8]

- Serum nitrate/ nitrite levels: These levels are lower in nulliparous women undergoing induction of labour with prostaglandins. Serum nitrate/nitrite levels are lower in women who delivered within 15 minutes than those who are not delivered.

(B) HISTORIC PROSPECTIVES OF PROSTAGLANDINS AND ITS ROLE IN INITIATION OF LABOUR

Kurzrok and Leib in 1930 noted the presence of prostaglandins in human semen and its ability to initiate uterine contractions. Von Euler named it as prostaglandins after isolating it from male prostate gland. (Von EULER 1936). He thought it was unique secretion from prostate gland. Later it was found that prostaglandins are large family of substances ubiquitous in mammalian biology. (Collin 1990; Calder 1997). There are six groups of Prostaglandins from Ato F.

- Prostaglandins E and F have been demonstrated in amniotic fluid of term women after rupture of membranes and it makes the pregnant uterus to contract. (Karim 1966) but amniotic fluid obtained from early gestation causes relaxant effect. (Karim 1967). The amniotic fluid concentration of prostaglandins increase with onset of labour. (Kierse 1973, Hibbard 1974) and with increasing

cervical dilatation. (Kierse 1973, 1974, 1977). Levels are lower in poor progression of cervical dilatation. (Kierse 1977, Reddy 1987). Prostaglandins are detected in umbilical cord, amnion, chorion, and placenta decidual and myometrial tissue with greater concentrations of PGE2 than PGF2alpha. (Williams 1976 B). There must be interaction of prostaglandin with the receptors specific to it for biological action. These receptors are present in significant numbers in both pregnant and non-pregnant uterus and they are sensitive to prostaglandin stimulation throughout pregnancy. (O'Brein 1995). In contrast oxytocin receptor concentration increases as pregnancy advances. (Fuchs 1984, O'Brein 1995).

Pre-induction sonographic measurement of cervical length in prediction of successful induction of labour.[9] **Pandis et al** done a study to determine the relationship between pre-induction sonographic measurement of cervical length and Bishop score and they compared the two measurements in the prediction of vaginal delivery within 24 hours. 240 women are taken for this study. Bishop score was determined by digital examination and cervical length was measured by trans-vaginal ultrasound. Multiple regression analysis showed that cervical length, Bishop Score and parity are independent predictors of the vaginal delivery within 24 h. In receiver operating characteristic curves, the cut-off point for prediction of successful vaginal delivery after induction was

28 mm for cervical length and 3 for Bishop Score. But, cervical length was a better predictor than the Bishop score, with sensitivity of 0.87 and specificity of 0.71 compared to 0.58 and 0.77, respectively. They concluded that trans-vaginal sonographic measurement of cervical length provides a better prediction of vaginal delivery within 24 hours of induction than Bishop's score.

Trans-vaginal Ultrasound for Cervical Assessment before Induction of Labour.[10] **Soon Ha Yang et al** done a study to evaluate the Trans vaginal ultrasonographic cervical assessment in prediction of outcome of labour induction and to compare it against the Bishop score. Bishop Score was assessed by digital examination, and trans-vaginal ultrasonography was performed in 105 women. Cervical length, presence of funnelling, funnel width, and funnel length are noted. The primary outcome was the active labour within 48 hours (successful labour induction). Secondary outcome was duration of outcome. Statistical analysis was performed .Induction of labour was successful in 89%. The area under receiver operating characteristic curve for cervical length was greater than Bishop Score in prediction of successful labour induction (z = 2.18; P < .05). Cervical length of <3.0 cm had sensitivity of 75% and specificity of 83%. Multiple logistic regression analysis demonstrated significant relationship between successful labour induction and cervical length but not Bishop Score (odds ratio = 0.24; 95% confidence interval, 0.096–0.59; P = .002). They concluded that cervical length measured by

trans-vaginal ultrasound is a useful and independent predictor of successful labour induction.

Sonographic assessment of the cervical length before induction of labor.[11] **Ibrahim et al** studied 120 women who underwent labour induction after determination of Bishop's score and trans-vaginal cervical length measurement. Results showed that trans-vaginal cervical length is shorter in women those who delivered vaginally (24.7+/-6.9) compared to those who delivered by caesarean section (26.5+/-8.2).78.3% delivered vaginally and 10 %(35.7%) delivered by caesarean section. Thus the conclusion was that both trans-vaginal cervical length and the Bishop's score are significantly associated with successful induction.

Rane et al[12] examined the effect of pre-induction cervical length, gestational age at induction, parity, body mass index (BMI) and maternal age on the possibility of successful vaginal delivery in women undergoing induction. Induction of labour was done in 822 singleton pregnancies and cervical length was measured by trans-vaginal sonography before induction. Cox's proportional hazard model was used for analysis. Successful vaginal delivery within 24 hours of induction in 64.5% and Caesarean sections 19.6% and they concluded that women undergoing induction of labour, pre-induction cervical length, gestational age at induction, parity, BMI and maternal age have significant effect on

the interval between induction and delivery within 24 hours, and the risk of caesarean section.

Maitra et al[13] a total of 100 women were studied to determine the trans-vaginal measurement of cervical length in predicting successful vaginal delivery within 24 hrs. Induction was carried out with Tab Misoprostol (25 micro gram). Bishop's score and sonographic cervical assessment was done prior to induction. Univariate and logistic regression analyses were used. At < or =3 cm cervical length, the rate of LSCS was <30%, while 4cm cervical length, the probability becomes >75%. Thus cervical length measurement by TVS is an independent predictor of successful labour induction and its better than Bishop's score as a method of pre-induction cervical assessment.

Keepanasseril et al[14] compared the ultrasonographic cervical assessment with Bishop score before induction in prediction of successful labour induction. This was a prospective study in 138 women. Cervical length, posterior cervical angle and funnelling are noted. Labour induction was successful in 106 (76.8%).The best cut-off point in receiver operating characteristics curve was 3.0 cm for cervical length had sensitivity of 84.9%, and a specificity 90.6%.of and 100 degrees for posterior cervical angle. Cervical length of 3.0 cm had a 90.6% and a posterior cervical angle of 100 degrees with 65% and 72%, respectively. They concluded that trans-vaginal sonographic assessment of cervical

length and posterior cervical angle is better than conventional Bishop Score in predicting successful labour induction in nulliparous women.

Pre-induction cervical length measurement in prolonged pregnancy (**Nicolaides et al**)[15] to determine the effect of parity on the pre-induction cervical length and the induction-to-delivery interval and successful vaginal delivery within 24hrs in women with prolonged pregnancy. In 382 singleton pregnancies, induction of labour was done. Univariate analysis showed cervical length and parity provide independent predictors of vaginal delivery and induction-to-delivery interval.

Parvin et al[16] aim of study was to compare Bishop's score and trans-vaginal cervical length measurement in prediction of caesarean section after induction.200 women participated in this study. The Area under Curve (AUC) for cervical length by ultrasonography was 0.69 (95% CI 0.6-0.77) and AUC for the posterior cervical angle was 0.38 (95% CI 0.29-0.47). ROC for cervical length is statistically different from both Bishop score and posterior cervical angle ($P < 0.001$).Cervical length measured by trans-vaginal ultrasonography has the potential to replace the Bishop score, provided the facility is available.

Trans-vaginal cervical length and BMI Predicts successful labour induction than Bishop's score.189 women participated in this study.BMI, trans-vaginal cervical length and Bishop's score are determined. Logistic regression analysis showed that cervical length and BMI were

independent predictors in determining the risk of caesarean section. ROC curve also showed that the cervical length and BMI are best parameters in predicting the risk of caesarean section compared to the Bishop score (the areas under the curve (AUC) are 0.819, 0.701 and 0.416, respectively).

Assessment of tolerability and prediction of caesarean delivery (**Tan et al)** [17] prospective study was performed on 249 women. Cervical length was measured with trans-vaginal ultrasound. A 10-point visual analogue scale (VAS) for pain was obtained for Bishop's score and trans-vaginal cervical length. Trans-vaginal sonography was less painful than digital examination for Bishop Score (mean difference in VAS score 3.46; P<0.001). P=0.015, respectively) and optimal cut-off points for predicting caesarean delivery is Bishop score<or=5 and Cervical length of >20mm. Trans-vaginal sonographic measurement is better tolerated than digital examination. Cervical length>20 mm at term before labour induction is an independent predictor of Caesarean delivery.

Trans-vaginal sonographic cervical assessment as a predictor of successful labour induction.[18]Trans-vaginal scan is done to determine cervical length and cervical gland area in 80 pregnant women. Bishop score and pre-induction serum prostaglandin E2 metabolite were determined by ELISA technique. Women with cervical length <3.0 cm and higher PGE2 levels had shorter labours (P< 0.01) .The PGE2 level was significantly higher in multiparous than nulliparous women (P <

0.01). Cervical measurement, parity and serum PGE2 were independent predictors of the mode of delivery.

Cervical length and volume in prediction of onset of labour.[19]The cervical length was longer and cervical volume was larger in women who delivered 7 days or more than those who delivered within 7 days of measurement in VBAC patients. The ROC curve for cervical length is more predictive than cervical volume (AUC: 0.711 vs. 0.594, *p*= 0.001).

To determine the accuracy of trans-vaginal cervical length and funnelling in predicting spontaneous onset of labour[20]. 150 women included in study and observed for onset of labour for 7 days and that they are significant predictors.

Trans-vaginal cervical length measurement in prediction of labour induction.[21]Raynor showed that Cervical length <3 cm and Bishop's score >4 had shorter labour. Logistic regression analysis showed that cervical length and parity are independent predictors of vaginal delivery.

To determine the effect of cervical length, parity on induction delivery interval and vaginal delivery within 24 hours[22]. Successful vaginal delivery occurred in 67% of women. In multipara the vaginal delivery was 30% higher than nulliparous with same cervical length.

Pre-induction cervical ripening with intracervical and intravaginal PGE2 gel[23]. In both these groups there is no difference in spontaneous vs induced labour, need for augmentation, induction delivery interval.

Glutaredoxin levels are increased in human cervix after prostaglandin treatment. These levels are 3 times higher in prostaglandin E2 treated women and plays an important role in cervical ripening.[24]

Comparison of quantitative elastography of cervix, Bishop's score, Ultrasound cervical length in prediction of successful labour induction. The cervical tissue strain was measured using tissue Doppler imaging by compressing the cervix in longitudinal axis. The functional cervical length provided better performance than Bishop's score and elastography of cervix.[25]

Ultrasound beats Bishop's score in prediction of labour induction. Cervical length measured trans-vaginally is a better predictor of vaginal delivery within 60 hours of labour induction than traditional digital examination.[26]

Intra-cervical application of PGE2 gel for induction of labour at term.50 patients with unfavourable cervix given 0.5 mg of PGE2 gel into cervical canal. There is a significant improvement of cervical score in women given PGE2 gel and no improvement in placebo group.[27]

Intra-cervical application of PGE2 gel for cervical ripening in unfavourable cervix in IUGR patients. 80 women with ultrasound diagnosis of IUGR(less than -2 SD) induction done and concluded PGE2 gel is safe method of cervical ripening in women with IUGR.[28]

PGE2 gel for priming and labour induction at term patients with unfavourable cervix. 50 women with unfavourable cervix induced with PGE2 gel. Normal deliveries are 96% and 4% of caesarean section.[29]

Cervical priming by multiple doses of intra-cervical PGE2 gel.172 women were induced with cerviprime. Multiple doses were required in 24.4%,2 doses in 18% cases, 3 doses in 6.4% cases to significantly alter Bishop's score.[30]

Intra-cervical PGE2 gel for cervical ripening in unfavourable cervix.50 patients at term induced with PGE2 gel. Success rate was 82 %(vaginal deliveries) and caesarean rate was 18%. Thus they proved that intra-cervical PGE2 gel is effective and safe method in term patients with unfavourable cervix.[31]

Induction of labour with PGE2 gel can be done in women with one previous LSCS. In 46 women induction was done and vaginal delivery was 65.21% in study group and 79% in control group.[32]

Evaluation of safety and efficacy of PGE2 gel in pre-labour rupture of membranes. The total labour duration , latent phase, rate of caesarean section were less compared to controls.[33]

PGE2 gel in ripening cervix. 75 patients were induced in unripe cervix. Mean duration of latent phase-10.34hrs. Induction delivery time-16.43 hrs. Vaginal delivery was 81.33% and LSCS was17.33%. Commonest indication for LSCS was foetal distress[34].

Dinoprostone to induce labour: To determine safety and efficacy of intra cervical dinoprostone in prolonged pregnancy. In the study group 16 primiparous women and 21 multiparous women required only one dose.5 primiparous women and 3 multiparous women required 2 doses. They concluded that intra-cervical gel is safe and acceptable method for labour induction of labour induction in both primi and multigravida[35].

Mika Nuutila et al conducted study in women with pre-eclampsia with intra cervical PGE2 gel. 62.6% of women in the study group entered into active phase of labour and augmented by oxytocin. Thus PGE2 gel is effective and safe method for cervical ripening[36].

Assessment of PGE2 gel in induction of labour induction: Prepedil is efficient in labour induction compared to artificial rupture of membranes with syntocin acceleration[37].

ANATOMY OF CERVIX [38]

The cervix is fusiform in shape and open at each end by small apertures called the internal and external os. The cervix is 5 cm in length and upper segment of cervix is portiosupravaginalis and lower vaginal portion of cervix is portiovaginalis. The ureter runs close to cervix 1.2 cm away from portiosupravaginalis. Before child birth the external os is small regular and circular opening but in multiparous women this orifice is converted in to transverse slit with anterior and posterior lips of cervix.

PHYSIOLOGY

The cervix is complex organ that undergoes changes throughout pregnancy and parturition[39].The cervix has unique construction to retain foetus till end of pregnancy and deliver safely during labour.The cervix contains predominantly fibrous connective tissue made up of extracellular matrix and smaller amount of cellular portion with smooth muscles, fibroblasts, epithelium and blood vessels (Ludmir and Sehdev). Extracellular matrix is made up of type 1 (70 %) and type 3 (30%) collagen[40]. These collagens are arranged in the form of triple helix. In addition extracellular matrix contains glycosaminoglycans, proteoglycans and elastin. Collagen fibres should crosslink to form long fibrils and maintain tensile strength. This is by the action of the enzyme peptidyl lysine oxidase. Cofactors are copper and vitamin c.

CERVICAL RIPENING

It starts in first trimester and continues till end of pregnancy and described as softening, effacement and dilatation of cervix. Among these softening is an important process because effacement and dilatation cannot occur without softening. Softening occurs without contractions but effacement and dilatation cannot occur without contractions.

SOFTENING of cervix occurs due to increased vascularity, stromal and glandular hypertrophy with changes in extracellular matrix.[41]The cervix is rigid throughout gestation because, dermaton sulphate binds to collagen. The concentration of dermaton sulphate and progesterone decreases in term and initiates inflammatory cascade and releases matrix metalloproteins causing collagen degradation.[42]Collagen fibrils interact with decorin or biglycan and thrombospondin-2.They bind together and form collagen fibrils of same diameter and packed in a regular and highly organized pattern. During ripening of cervix there is increased spacing between fibrils and hence there is disorganisation of collagen fibrils. In ultra-structure analysis by electron microscopy of rat cervix suggested that collagen dispersion predominates in ripening rather than degradation (Yu and colleagues, 1995). Decorin is the small molecular weight proteoglycan produced by cervical cells during pregnancy.[43] The ratio of decorin to collagen increases and hence dispersal of collagen fibrils occurs. The disorganisation of cervix allows

influx of water and makes cervix to distend. Further collagen is degraded by the enzyme collagenases both intracellularly and extracellularly to weaken collagen and this favours cervical ripening.

The cervical changes are induced by oestrogen, progesterone, relaxin, cytokines, prostaglandin and nitric oxide synthesis enzymes.[44]

Nervous system also contributes to process of cervical ripening. Sensory fibres from L6 to S1 terminate in cervix and synthesize neurotransmitters (vasoactive neuropeptide, substance Calcitonin gene related peptide) and induce cervical softening.[45]

MEASUREMENT OF CERVICAL SOFTENING

COLLASCOPE is used for quantitative estimation of cervical ripening. It uses light induced fluorescence of the cross linked collagen to allow obstetrician to distinguish between labour and non-labour state of cervix.

FLUORESCENCE SPECTROSCOPY OF COLLAGEN: It provides information of structure and dynamics of macromolecules (collagen) and its location at microscopic levels.[46]

CERVICAL LIGHT INDUCED FLUORESCENCE (LIF): Study on cervical collagen was done to know about changes of cervical

LIF in pregnancy. These values are obtained noninvasively with collascope.[47]

Women who delivered within 24 hours of measurement had lower LIF compared to those delivered 24 hours later.

VARIOUS METHODS OF LABOUR INDUCTION

- **NON PHARMACOLOGIC CERVICAL RIPENING**

1. Herbal supplements-They are black haw, evening primerose oil, red raspberry leaves, black and blue cohosh.They enhance uterine contractions but their role in cervical ripening is uncertain[48]

2. Castor oil, Hot baths and Enemas- there is no evidence to support that they cause cervical ripening[49]

3. Sexual intercourse- is recommended for labour initiation. Stimulation of breast and nipple release oxytocin. Lower uterine segment is stimulated by penetration.[49]

4. Breast stimulation: It releases oxytocin and induces labour. Massaging of breasts with hot compresses three times a day causes oxytocin release and foetal heart rate abnormalities similar to oxytocin challenge test[49.]

5. Acupuncture / transcutaneous nerve stimulation: Here fine needles are inserted that stimulates channels of energy and they are directed to

specific organ but effectiveness is limited for labour induction.Transcutaneous nerve stimulation causes release of prostaglandins and oxytocin[50].

MECHANICAL METHOD

They cause local pressure and releases prostaglandin.Risks are endometritis and neonatal sepsis , membrane rupture, bleeding and placental disruption. Hygroscopic dilators absorb endocervical fluid and device expands and causes mechanical pressure. Natural is Laminaria japonicum and synthetic is lamicel. Ballon devices(26 Fr Foley catheter) is placed in cervix and balloon is filled[51].

SURGICAL METHOD

1. Stripping of membranes-it results in increased activity of prostaglandin F2alpha and phopholipase A2 and release of prostaglandins during dilatation of cervix.

2. Amniotomy-it releases prostaglandins locally but this alone cannot be used for induction of labour.

PHARMACOLOGICAL METHOD OF CERVICAL RIPENING

1. Misoprostol is PGE1 analogue. Not approved by U.S Food and Drug administration. 25 mcg of intravaginal misoprostol used every 4-6 hours for cervical ripening. Risk is

tachysystole. There are higher rates of vaginal delivery and literature indicates misoprostol as an effective agent for cervical ripening[52].

2. Mifepristone- its antiprogesterone. Labour induction is successful with mifepristone but about foetal outcomes data is insufficient[53]

3. Oxytocin- the advantage is that induces contractions similar to natural labour

4. Prostaglandin E2 analogue

VARIOUS ROUTES OF PGE2 ADMINISTRATION

INTRAVENOUS PGE2

This mode of delivering PGE2 is not in use, because small margin between the doses that causes contractions and hyperstimulation.[54]

Thermogenic effects of PGE2 are difficult to differentiate from chorioamnionitis.

EXTRA-AMNIOTIC PGE2

Insertion of endo-cervical gel into above internal os but increased uterine response is seen in these preparations.

ORAL PGE2

In 1970 it was popular, but higher levels of oral PGE2 is required than other routes and vomiting was common.[55]

ENDOCERVICAL PGE2 GEL

Otherwise known as intracervical gel. Prepedil and cerviprost are available commercially.It reduces cervical resistance and dilates the cervix and reduces rate of failed induction[56]. Hyperstimulation is more with endocervical PGE2 than others.

VAGINAL PGE2 GEL

It causes ripening of cervix , used in doses of 1-3mg/dose. Trail study has proved oxytocin need is 3 times less in women primed with vaginal PGE2 gel and no case of hyperstimulation.[57]

CERVIPRIME GEL

Dinoprostone 0.5 mg/3 g of gel is the active component of PGE2 gel. Other components are triacetin USP (2760 mg/3 g) and colloidal silicon dioxide (240 mg/ 3g). Chemical name is 11, 15-Dihydroxy-9-oxo-prosta-5, 13-dien-1-oic acid. Dinoprostone instilled intracervically acts on uterine myometrium and cause contractions similar to spontaneous onset of labour. Vomiting and diarrhoea are due to stimulation of smooth muscles of gastrointestinal tract by dinoprostone.

Elevated body temperature seen with dinoprostone gel in Humans and lowered blood pressure in animals with larger doses of dinoprostone. Local action is cervical ripening and decreases cervical resistance. After induction active metabolite 13, 14-dihydro-15-keto-PGE2 in plasma in 0.5 to 0.75 hours. PGE2 is metabolized in lungs, liver and kidney. PGE2 gel is brought to room temperature (15^0to30^0 C or 59^0to86^0 F).

Category C drugs- its embryo toxic and causes skeletal anomalies in rats and rabbits.

MODE OF APPLICATION

Before application assembly has to be done. The protective end cap is removed and used as a plunger extension in the barrel of syringe. Endo cervical catheter is selected after careful vaginal examination. Under aseptic precautions sterile shielded catheter is removed from package. Fit the catheter hub to syringe and catheter is filled with sterile gel and expel air prior to instillation by pushing plunger assembly. The dinoprostone gel is administered with patient in dorsal position. The contents are instilled into cervix below level of internal os. When there is no effacement 20 mm endo-cervical catheter is used and 10 mm catheter if cervix is 50% effaced.

To minimize leakage of gel patient is rested in supine position for 15-30 minutes. The repeat dose is decided after 6 hours based on vaginal

examination. Maximum recommended dose is 1.5 mg of dinoprostone gel (7.5 ml of gel).Gel is available as sterile semi-translucent viscous preparation. It has to be stored in refrigerator (36^0to46^0C or 2^0 to 8^0F). **Side effects**: fever, back pain, gastrointestinal side effects, uterine contractility-maternal. Brady-cardia and Decelerations in foetus.

Prostaglandins cause contraction of myometrium due to increase in intracellular calcium level.

TACHYSYSTOLE: Its complication of intra-cervical PGE2 gel.3-5 contractions in 10 minute period is normal, when its >5 contractions in 10 minute period is tachysystole.

LABOUR INDUCTION

DEFNITION:" Labour induction is the stimulation of uterine contractions before the spontaneous onset of labour, with or without ruptured membranes".

Global incidence -20 %(RCOG – Evidence based clinical guide line number 9).

In USA-incidence of labor induction: 22.5%

Induction is indicated before spontaneous onset of labour when the benefits to the mother or fetus outweigh continuation of pregnancy.

Induction of labour is one of the most common interventions practiced in modern obstetrics.

The reasons for rising rates of labour induction are as follows[58]

1. Widespread availability of cervical ripening agents.
2. Ability of physicians to estimate gestational age accurately has improved with early dating scans and hence avoiding iatrogenic prematurity.
3. Knowledge regarding methods and indications for labour induction has improved.
4. Relaxed attitudes towards elective indications, both by physician and patient
5. Litigation constraints.

CRITERIA FOR AN IDEAL INDUCING AGENT: [58]

1. labour onset is achieved within shortest possible duration.
2. Lower incidence of failure rate.
3. Labour pain should not be greater than spontaneous labour pains and should not require more analgesia.

4. Perinatal morbidity should not be more compared to spontaneous labour.

5. Caesarean and operative vaginal delivery rates should not be more than spontaneous labour.

Till now, no ideal inducing agent is available to fulfill the above criteria.

Thus proper and careful selection of patients for induction has to be done.

COUNSELLING COUPLE PRIOR TO INDUCTION

Counseling of patient and family prior to induction.

While counseling, the following should to be discussed:

1. The reason for induction and the risk associated with continuation of pregnancy.

2. Explain about arrangements for support during labour

3. Time and procedure of induction.

4. Pain relief measures since induced labour is more painful than spontaneous labour.

5. The risks with induction of labour.

6. Regarding close monitoring of fetal heart rate and electronic fetal monitoring in labour

7. If patient refuses induction- counsel about other options.

8. If induction fails counsel about other options available.

INDUCTION OF LABOUR IS RECOMMENDED IN

1. Prolonged pregnancy

2. Prelabour rupture of membranes

3. Hypertensive disorders of pregnancy- Gestational hypertension, preeclampsia or eclampsia or Hypertension.

4. Fetal macrosomia.

5. Maternal request (1-3%) (WHO guidelines 1-5)

6. Gestational diabetes mellitus

7. Intrauterine fetal death (IUD) (6-7 NICE clinical guidelines 70-induction of labour)

8. Chorioamnionitis.

9. Intrauterine growth restriction (IUGR).

10. Maternal medical indications-

    Diabetes mellitus,

Cholestasis of pregnancy

Renal disease,

Chronic pulmonary disease and

Antiphospholid antibody syndrome.

11. Isoimmunization

12. Oligohydramnios

13. Elective induction- maternal social or geographical factors. (e.g.distance from hospital and psychosocial factors) [ACOG guidelines 8-13]

CONRAINDICATIONS FOR LABOUR INDUCTION

1. Prior classical uterine incision or prior transfundal uterine surgery.

2. Antepartum hemorrhage/Placenta previa/Unexplained vaginal bleeding.

3. Umbilical cord prolapse.

4. Transverse or oblique lie. (ACOG guidelines)

5. Cephalopelvic disproportion / pelvic structural deformities.

6. Active genital herpes infection.

7. Invasive cervical carcinoma.

8. Hypersensitivity to cervical ripening agents

INDUCTION OF LABOUR NOT RECOMMENDED IN

Breech presentation

Severe fetal growth restriction (NICE clinical guidelines 70-induction of labour)

Multiple pregnancy

Asthma, Glaucoma

Breech presentation

Polyhydramnios

Severe hypertension

Maternal heart disease

EVALUATION BEFORE INDUCTION OF LABOUR[59]

MATERNAL CRITERIA

1. Confirm indication for induction.

2. Clinical pelvimetry to assess pelvic adequacy.

3. Assessment of cervical favourability (Modified Bishop's score)

4. Review contraindications to vaginal delivery.

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

FETAL CRITERIA

1. Confirm gestational age.
2. Estimate fetal weight (by clinical or ultrasound examination)
3. Determine fetal presentation.
4. Confirm fetal well-being.
5. Assess need to document fetal lung maturity status.

CRITERIA FOR CONFIRMATION OF GESTATIONAL AGE AND FETAL LUNG MATURITY

CONFIRMATION OF GESTATIONAL AGE

1. Fetal heart tones have been documented >30 weeks by Doppler ultrasound.
2. >36 weeks since a positive serum or urine human chorionic gonadotropin pregnancy test.
3. Ultrasound measurement at less than 20 weeks of gestation supports gestational age >39 weeks.

FETAL LUNG MATURITY:

If term gestation cannot be confirmed by two or more of the above criteria amniotic fluid analysis can be done to provide evidence of fetal

lung maturity. The parameters for evidence of fetal pulmonary maturity are as follows:

1. Lecithin / sphingomyelin (L/S) ratio>2.1
2. Presence of phosphatidyl glycerol (PG).
3. TDXFLM assay >70 mg surfactant per 1 kg of albumin present.
4. Presence of saturated phosphatidylglycerol choline (SPC) >500 ng/mL for pregestational dibetic patients.
5. Lamellar body count >30,000/mcL.

PREINDUCTION CERVICAL ASSESSMENT

Success of labour induction depends on favourability of cervix.

The goal of cervical ripening is to facilitate the process of cervical softening, effacement and dilatation thus reducing induction delivery interval.

When there is indication for induction and cervix is unfavourable,cervical ripening agents are used.

The status of cervix is determined by Bishop’s scoring system.

Calkin and colleagues caried out systematic studies of the factors influencing duration of first stage of labour. They concluded that the length, thickness and consistency of cervix are important factors.

The modified Bishop's score is the most commonly used system for evaluation of cervix before induction.

In 1964, Bishop proposed a scoring system to know about suitability of women for induction of labour.[60]

This pelvic score was based on following parameters as follows: [61]

	0	**1**	**2**	**3**
Dilatation	0	1-2	3-4	5-6
Effacement%	0-30	40-60	60-70	80+
Station	-3	-2	-1/0	+1/+2
Consistency	Firm	Medium	Soft	
Position	Posterior	Mid position	Anterior	

Bishop's score done to increase predictability of successful induction.

Modified Bishop's score (Calder 1974)

	0	**1**	**2**	**3**
Dilatation(cm)	<1	1-2	2-4	>4
Effacement (%)	>4	2-4	1-2	<1
Station(cm)	-3	-2	-1,0	+1/+2
Consistency	Firm	Average	Soft	
Position	Posterior	Mid-anterior		

Bishop's score of 9 indicates likelihood of successful induction and score of 4 or less identifies unfavourable cervix and indicates cervical ripening. As Bishop's score decreases there is increased rate of unsuccessful induction.

CERVICAL EXAMINATION

EFFACEMENT: The degree of effacement is expressed as length of cervical canal. Cervix is 100% effaced when it's thin and lie adjacent to lower uterine segment.

DILATATION: is estimated by measuring the diameter of cervical opening from one margin of cervical opening to other margin. The maximum diameter that the cervix can dilate is 10 cm.

POSITION: Its relationship of cervical os and Posterior, Mid position and anterior are the categories.

CONSISTENCY: Soft, medium and firm

STATION: The level of foetal presenting part in relationship to ischial spines is station. When presenting part at level at level of ischial spines its zero station, above it is -1,-2,-3 and below it is +1, +2, +3.

BURNETT'S MODIFICATION OF BISHOP'S SCORE: [62]

FACTOR	0	1	2
Dilatation	<1.5	1.5-3	>3
Station	-2 or higher	-1	0 or lower
Position	Posterior	Mid	Anterior
Effacement(cm)	1.5 or more	Intermediate	0.5 or less
Consistency	Firm	Intermediate	Soft

The maximum score given by Burnett is 10 and each parameter given maximum score of 2. He considered previous term birth and cephalic presentation are indications and previous uterine surgery as a contraindication for induction. When scoring is 6 to 8 they deliver within

6 hours, and when its 9-10 they deliver within 4 hours. Score of <6 are unfavourable.

FIELD'S System for rating readiness for induction[63]

	0	**1**	**2**
Timing of induction Versus EDC(weeks)	Uncertain or >3 weeks prior	1-3 weeks prior	Within 1 week
Attitude	Objects/fear	Hesitates/accepts	Enthusiastic
Expected foetal weight(grams)	<2,500	Uncertain	>2,500
Uterine tone on palpation	Flaccid	Some tone	Firm
Softness of cervix	Firm	Firm, Somewhat soft	Soft
Effacement (%)	<80	80	>80
Position of cervix	Posterior	45 degree to vaginal axis	Towards vulva
Station of presenting part(cm)	-2 or higher	-1 to 0	+1 or lower
Dilatation	0-1	2-3	>3
Vaginal discharge	No change	Increased	Blood tinged

EDC: Expected date of confinement.

When score is 16 or more it's favourable for induction.

FAILED LABOUR INDUCTION

Friedman's studies have shown that failure of transition from latent to active phase is failed labour induction. Regular and painful contractions are not associated with cervical changes or active phase is not attained with 12 hours of oxytocin infusion (20mu/min) is failed induction.

LABOUR DURATION

Labour induction is done in unfavourable cervix. Cervical dilation at time of admission is an important factor determining latent phase duration. Active phase of labour in induced labour is shorter or same in compared to spontaneous labour. The transition from latent to active phase depends on uterine activity and cervical dilation.

UTERINE ACTIVITY

Uterine activity is measured by Montevideo units (MU) and its product of intensity/amplitude and frequency of each contraction (number of contractions in 10 minute interval). Caldeyro-Barcia illustrated that uterus maintains resting pressure of 20 mm of Hg before 30 weeks. There is an increase in frequency, intensity and coordination of uterine contractions after 30 weeks. Uterine activity in beginning of labour is between 80-120MU and in normal labour the range of uterine activity is between 75-375MU.

Uterine activity integral is most widely used method. It includes contraction frequency, strength and duration over 10 minute period. It's measured in kilopascal second (kpas).The rate of cervical dilatation is mainly determined by mean active pressure.

ULTRASOUND ASSESSMENT OF CERVICAL LENGTH:

TRANSABDOMINAL ULTRASOUND:

Cervical length was measured initially by Trans abdominal ultrasound. But the disadvantages are as follows

Pre-requisite for Trans abdominal measurement of cervical length is distended bladder.

Bladder distension distorts cervical length and falsely lengthens the cervix obscuring the funnelling.

The resolution is further altered by maternal obesity and shadowing from foetal parts.

Probe to cervix distance is long and clear visualisation of cervix is hampered.

Hence it's less reliable method for evaluating cervical length.

TRANSPERINEAL ULTRASOUND

Otherwise known as translabial ultrasound measurement of cervical length.

The patient is positioned on table with hips and knees flexed and the gloved transducer is placed over the perineum in a sagittal orientation between labium majora.

Pre-requisite is empty bladder and foetal parts does not interfere with visualisation of cervix.

ADVANTAGES

Transducer is close to cervix and no need for entry into vagina; hence pressure over cervix is avoided.

Compliance by the pregnant patient is good.

DISADVANTAGES

External of is obscured by rectal gas.

Visualisation of cervix is poor compared to trans-vaginal ultrasound.

TRANSVAGINAL ULTRASOUND

Gold standard technique for evaluation of cervix.

It's an objective method to assess cervical length and to detect changes in internal os.

MRI measurement of cervical length is comparable to the trans-vaginal cervical length measurement. But MRI is expensive and possesses potential hazards in women with ferromagnetic foreign bodies.[64]

RECOMMENDATIONS FOR TRANSVAGINAL CERVICAL LENGTH MEASUREMENT ARE AS FOLLOW:

1. Empty bladder

2. Trans-vaginal probe is covered by condom (to prevent cross infection among patients). Operator should use sterile hand glove for self-protection. In an over anxious patient ask the patient herself to place probe in vagina.

3. Trans-vaginal probe is placed in anterior fornix and cervical length is measured in sagittal plane with long axis viewing echogenic endo-cervical mucosa along entire length of cervical canal.

4. Manipulate until entire cervical canal is visualized from external os to internal os (Diameter of cervical canal measured at the level of cervical canal meeting the amniotic sac) along endo-cervical canal. Avoid undue pressure over cervix to avoid false lengthening of

cervix. If echogenicity of cervix is increased it indicates excessive pressure, withdraw the probe and reapply.

4. Cervical length is measured three times in succession and shortest of the three is taken as cervical length in millimetres. Cervical length can be measured either as a sum of 2 straight lines that follows the curve (when deviation of canal is more than 5 mm) or straight line between internal and external os.

5. Transfundal pressure is applied for 15 seconds and changes in cervical length and funnelling is noted(Funnelling or wedging is any triangle V/U at the area of internal os with apex anywhere along cervical canal).

FOR BETTER RESULTS

1. External os should be symmetrically visible and internal os at isosceles angle.

2. The endo-cervical canal has to be seen from internal os to external os.

3. Increased echogenicity of cervix is avoided because it indicates excessive pressure.

ANATOMIC DIFFICULTIES

1. Myometrial contractions interfere with visualisation of internal os and hence cervix appears longer.

2. Cervical length may change during examination.

3. Endo-cervical polyps and mucus in the canal cause separation of anterior and posterior borders and cervix appears shorter.

TECHNICAL DIFFICULTIES:

1 Minimal pressure over cervix causes elongation of cervix.

2. Experienced persons several diagonal angles can be obtained providing shorter cervical length than in true sagittal plane.

CERVICAL LENGTH AT DIFFERENT GESTATIONAL AGE

Gestational age	Cervical length
20 weeks	40 mm
24 weeks	35mm
34 weeks	34mm
Term (37-42 weeks)	28mm

OTHER BENEFITS OF TRANSVAGINAL SONOGRAPHIC MEASUREMENT OF CERVICAL LENGTH

1. PRETERM LABOUR[64]:

Shorter the cervix more the risk of preterm labour. The cervical length <2.5 cm at 24 weeks is the most important predictor of preterm birth.

2. CERVICAL LENGTH IN TWIN GESTATION:

Trans-vaginal sonographic measurement of cervical length at 24-26 weeks if>35 mm indicates they are at low risk for delivering before 34 weeks.

3. CERVICAL LENGTH IN WOMEN WITH ENCIRCLAGE:

Trans-vaginal circlage is placed in middle part of cervix. Measurement of cervical length in post encirclage patients showed increase in length compared to pre-encirclage. If cervical length is <2.5cm and <1cm in the portion above cerclage are best predictors of preterm birth.

4. TRANSVAGINAL CERVICAL LENGTH IN THOSE WITH SUSPECTED PRETERM LABOUR[65]:

Measurement of cervical length in symptomatic patients decreased incidence of admission in hospital and cost but not preterm births.

5. PPROM:

The latency period between 24-32 weeks is 2 days if cervical length is 20mm and 6 days if length is>20mm.

FOETAL FIBRONECTIN (FFN)

FFN is glycoprotein found in placental tissue, decidua basalis and amniotic fluid. Before amnion and decidua fuses FFN is present in cervicovaginal secretions at 16 weeks. It disappears after 22 weeks. If FFN appears again indicates disruption of choriodecidual interface.

Another non-invasive modality to assess changes in cervix is cervical water content MRI.

MATERIALS AND METHODS

STUDY DESIGN

Prospective observational study.

PLACE OF STUDY

ESI PGIMSR, KK Nagar, Chennai.

PERIOD OF STUDY

JAN 2012 to NOV 2013.

INFORMED CONSENT

For trans-vaginal ultrasound and induction of labour.

SAMPLE SIZE : 250.

95% Confidence interval and 5% precision sample is 250. The pregnant women with Gestational age between 37-42 weeks decided for cerviprime induction has been taken in the study.

FORMULA: Z2 (P [1-P])/d2.

INCLUSION CRITERIA:

Singleton live cephalic presentation.

Reactive CTG.

Bishop’s score<4

Rh negative pregnancy,

Pre-eclampsia,

Gestational diabetes mellitus,

Post-dated pregnancy.

Patients who had given consent for study.

EXCLUSION CRITERIA:

Antepartum haemorrhage,

Previous uterine surgeries.

Heart disease complicating pregnancy,

Cephalopelvic disproportion,

Bronchial asthma.

Glaucoma,

Hepatic and renal disease.

Hypersensitivity to prostaglandins.

In spontaneous onset of labour.

METHODOLOGY

All antenatal women under inclusion criteria are subjected to digital examination to determine Bishop's score. Total score is 12. Women with Bishop's score of <4 are induced PGE2 gel.

Before induction trans-vaginal sonographic measurement of cervical length is done after getting informed consent for trans-vaginal cervical length and induction of labour. Trans-vaginal cervical length is measured with LOGICQC Series machine with 6MHZ trans-vaginal probe.

PRE-REQUISITES are

1. Empty bladder (for clear visualization of cervix).

2. No spontaneous uterine contractions.

Cervical length is measured in sagittal plane with trans-vaginal probe in anterior fornix of cervix. Manipulate till entire cervical canal is visualized from internal to external os in a straight line. Cervical length is measured 3 times in succession. Shortest length of three values obtained is used for analysis. Diameter of cervical canal is also measured at the level of internal os where cervical canal meets the amniotic sac. Funnelling/Wedging (Any triangle v/u at the area of internal os with apex along cervical canal) is also noted.

MODE OF APPLICATION OF PGE2 GEL

Bladder is emptied and foetal heart rate is recorded. With patient in lithotomy position 0.5 mg of PGE2 gel is applied intracervically under aseptic precautions. Foetal heart rate is recorded before and after

application of PGE2 gel. Patient is rested in lateral position for 30 minutes. Dose is repeated after 8 hours interval. Maximum is 3 doses. Before each dose of PGE2 gel cervical length is measured trans-vaginally. Subsequent dose is withheld

If patient is active labour.

when contractions are regular (3 in 10 minutes)

In active phase of labour artificial rupture of membranes was done with 4 cm dilated and 80% effaced. Successful induction is occurrence of active labour within 72 hours of induction. Failed induction is inability to achieve the active phase within 72 hours from initiation of induction. Failure to progress is when there is no cervical dilatation for 2 hours in active phase and no foetal descent for 1 hour in stage with adequate uterine contractions. Its indication for caesarean section.

PRIMARY OUTCOME

* Trans-vaginal cervical length that predicts Successful vaginal delivery within 72 hours of induction.

SECONDARY OUTCOME

* Duration of latent phase

* Total labour duration

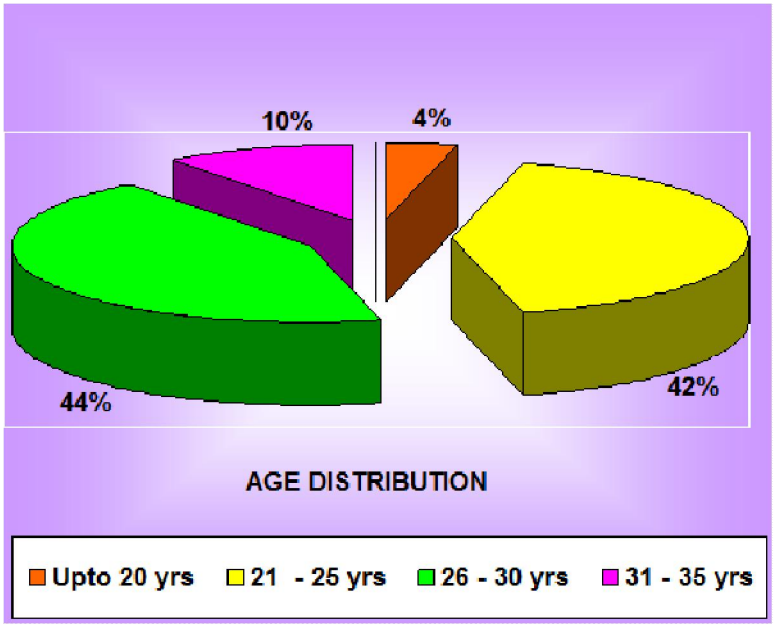
RESULTS

250 women with gestational age of 37-42 weeks were enrolled in the study and induction with PGE2 gel is done after measuring trans-vaginal cervical length. Demographic variables are summarized.

TABLE – 1 : AGE DISTRIBUTION

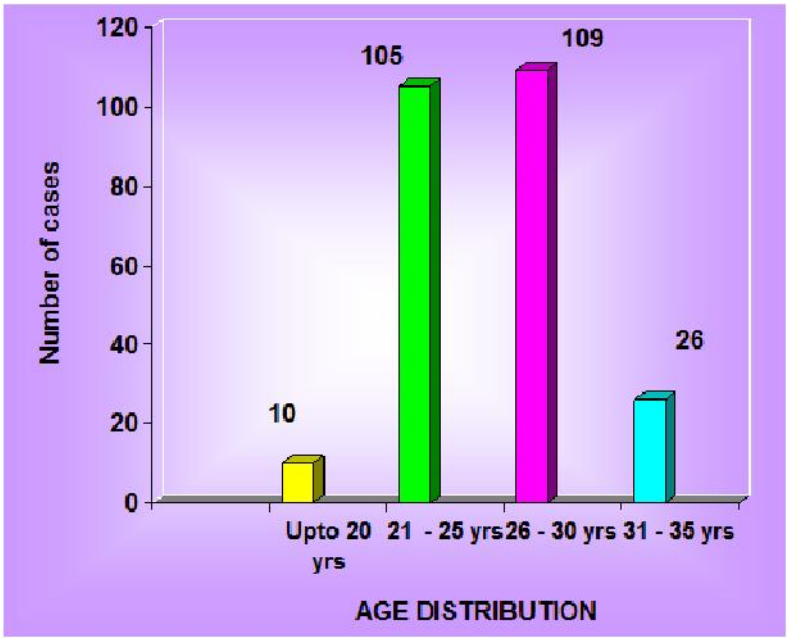
Age group	**Cases**	
	No	**%**
Up to 20 years	10	4.0
21-25 years	105	42.0
26-30 years	109	43.6
31-35 years	26	10.4
Total	250	100
Range	18-35 years	
Mean	25.9 years	
SD	3.5 years	

GRAPH – 1 : AGE DISTRIBUTION



Range of pregnant women in the study is between 18-35 years. Maximum number of women in our study group is between 26-30 years (44%).

GRAPH - 1A : AGE DISTRIBUTION.



Bar chart showing the maximum number of women in study group between 26 to 30 years.

TABLE – 2 : OBSTETRIC SCORE

Obstetric score	Cases	
	No	%
Primigravida	164	65.9
Multigravida	86	34.1
Total	250	100

The maximum number of women requiring induction in our study group is primi with (65.9%). Multiparous women requiring induction is 34.1%.

GRAPH : 2 - OBSTETRIC SCORE

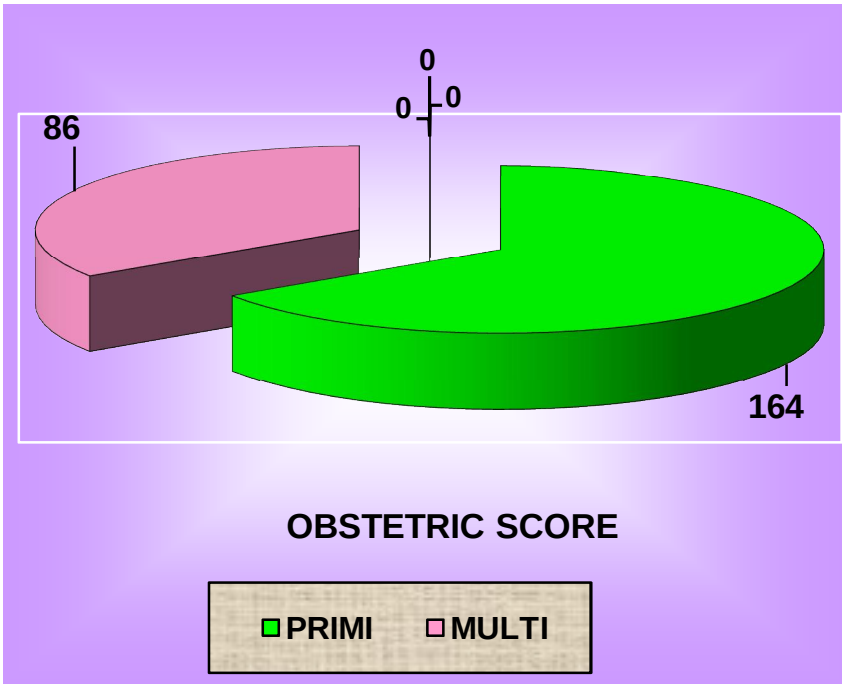


TABLE - 2A: OBSTETRIC SCORE AND MODE OF DELIVERY

Obstetric Score	Total cases	Mode of delivery			
		Normal delivery		LSCS	
		No.	%	No.	%
Primi	164	71	43.2%	93	56.7
Multi	86	63	73.3	23	26.7
'p'	**< 0.0001 Significant**				

In Primiparous women 43.2% deliver vaginally and 56.7% by LSCS but in multiparous women 73.3% deliver vaginally and 26.7% by LSCS. It indicates that parity is an independent predictor of vaginal delivery.

GRAPH - 2A : PARITY AND MODE OF DELIVERY

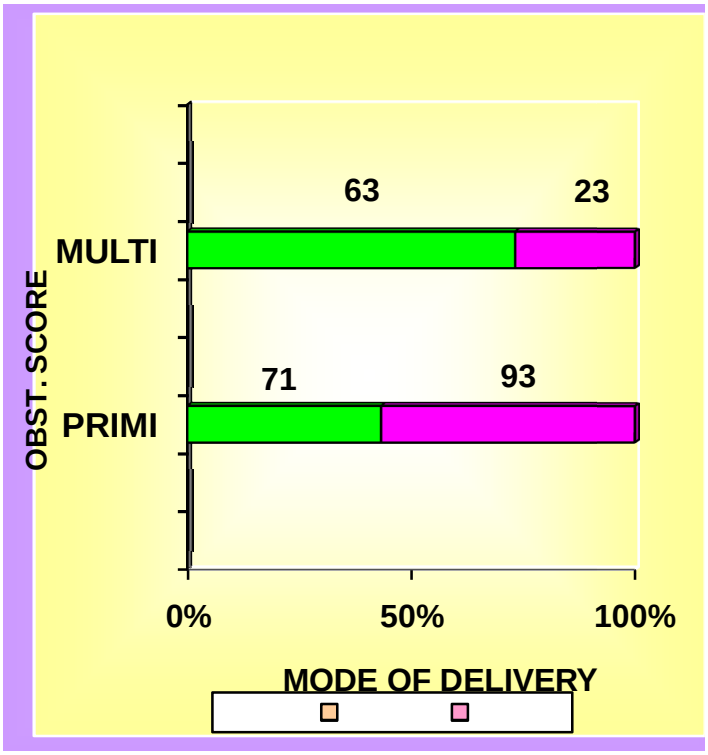


TABLE – 3 : HEIGHT/ WEIGHT/ BMI

The Average Height And Weight Of Pregnant Women In Our Study Is 154.2 Cm And 56.3 Kg Respectively

Variables	Range	Mean	SD
Height (in cm)	138-169	154.2	5.4
Weight (in kg)	40-119	56.3	9.4
BMI	17.7 – 52.8	25.0	3.8

TABLE - 3A : B M I AND MODE OF DELIVERY

B M I	Total cases	Mode of delivery			
		Normal delivery		LSCS	
		No.	%	No.	%
Upto 20	9	7	77.8	2	22.2
20.1 – 25	137	90	65.7	47	34.3
25.1 – 30	88	32	36.4	56	63.6
Above 30	16	5	31.3	11	68.8
Mean BMI		**24.23**		**25.86**	
S.D.		**3.72**		**3.81**	
'p'		**< 0.0001 Significant**			

GRAPH – 3 : HEIGHT/ WEIGHT/ BMI

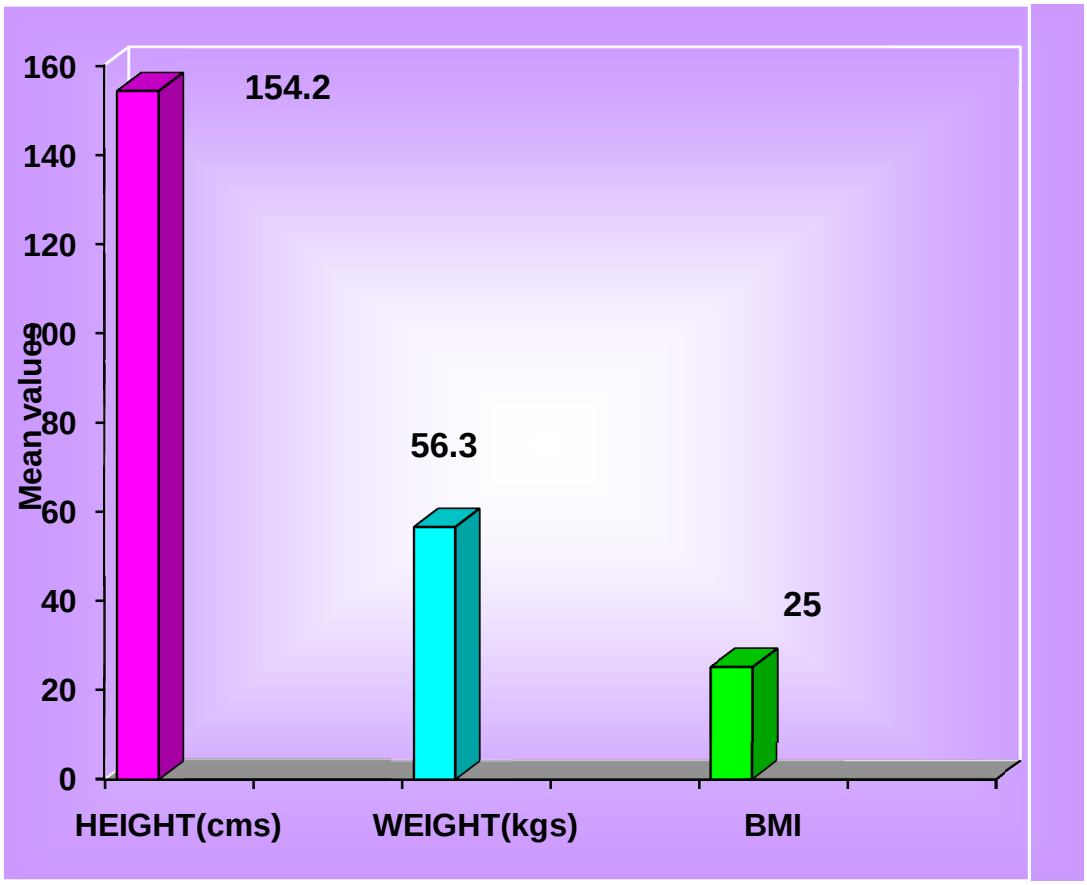


TABLE - 4 : GESTATIONAL AGE

Parameter	Gestational age (in weeks)
Range	37 weeks to 41 weeks +5 days
Mean	39.59 weeks
SD	0.96

Pregnant women induced with cerviprime gel is in our study is between 37 to 42 weeks of gestation.

GRAPH – 4 : GESTATIONAL AGE

The mean gestational age of induction is 39.6 weeks in study

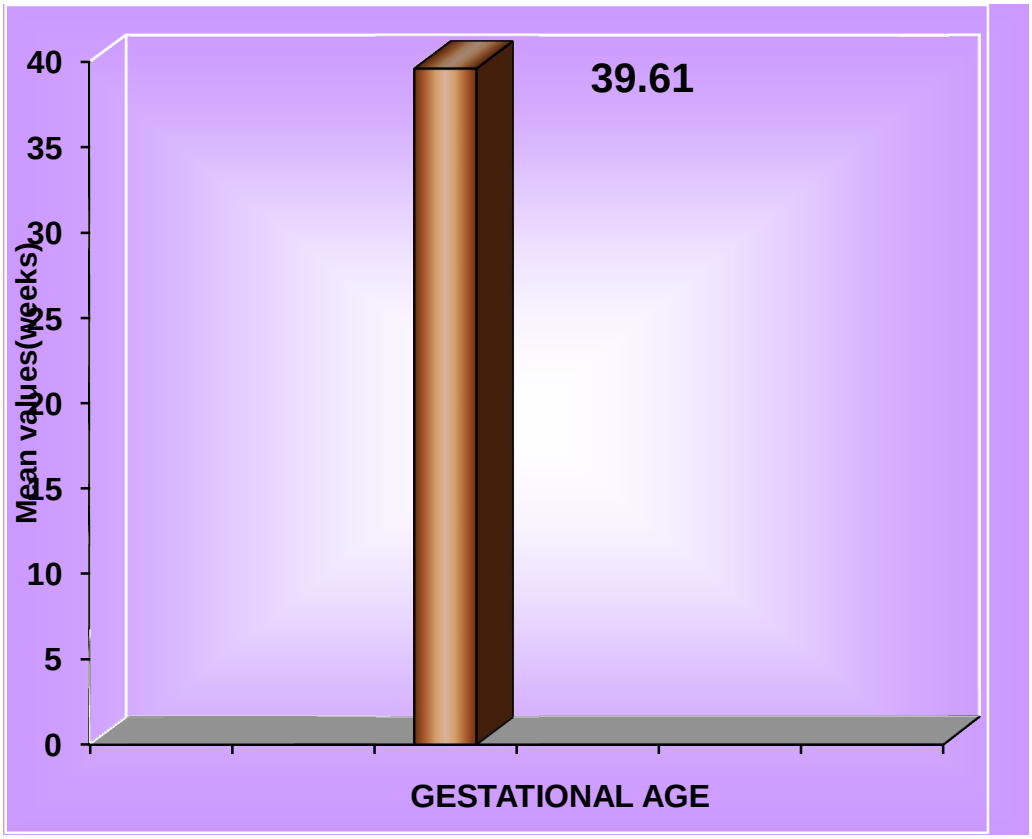


TABLE – 5 : INTERVAL SINCE LAST CHILD BIRTH

In multiparous women average interval since last child birth is 4.5 years.

Parameter	Interval since last child birth (years)
Range	2-10
Mean	4.58
SD	2.63

TABLE – 6 : RISK FACTORS

Risk factors	Cases	
	No	%
Anaemia	10	4.0
DM on insulin	2	0.8
GDM on insulin	22	8.8
GDM on Meal plan	19	7.6
Epileptic	1	0.4
Gestational hypertension	9	3.6
HBS AG+	2	0.8
Hypothyroid	5	2.0
Pre eclampsia	15	6
Rh negative	6	2.4
Sickle cell trait	1	0.4
Total cases with risk factors*	37*	14.8
Total cases without risk factors	213	85.2
Total	250	100

Most of the cases had more than one risk factor.

GRAPH - 6 : RISK FACTORS

85.2% of Women in study have no risk factors and 14.8% of women with risk factors.

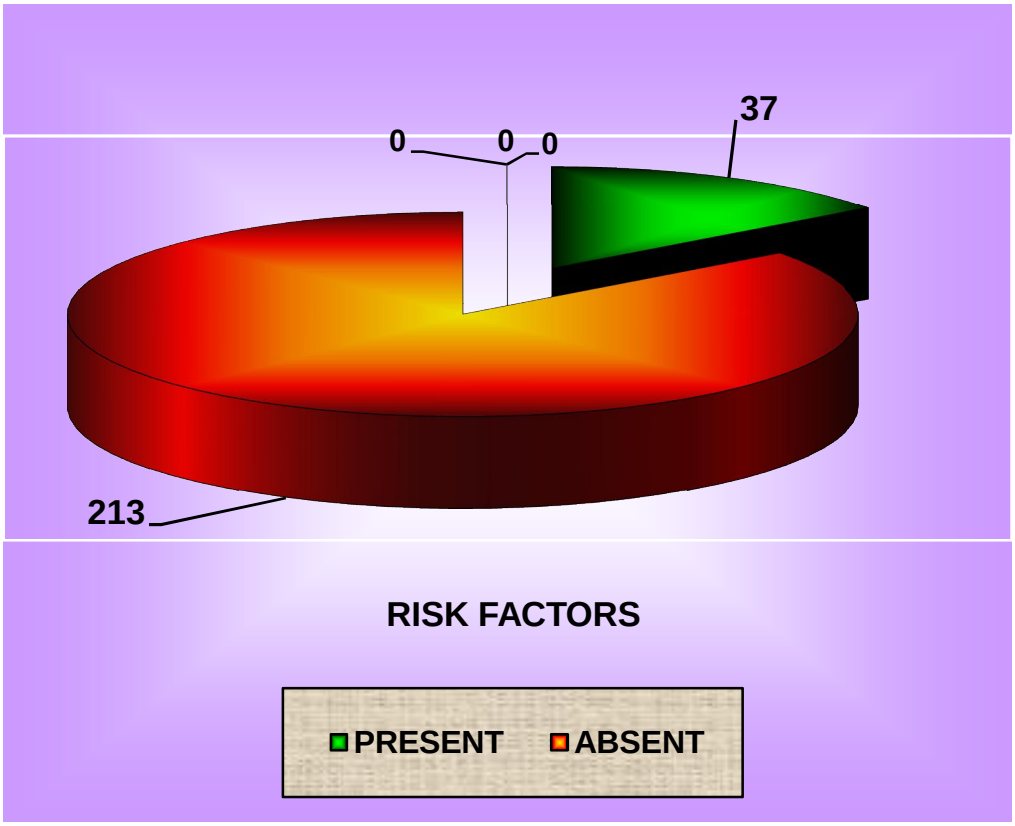
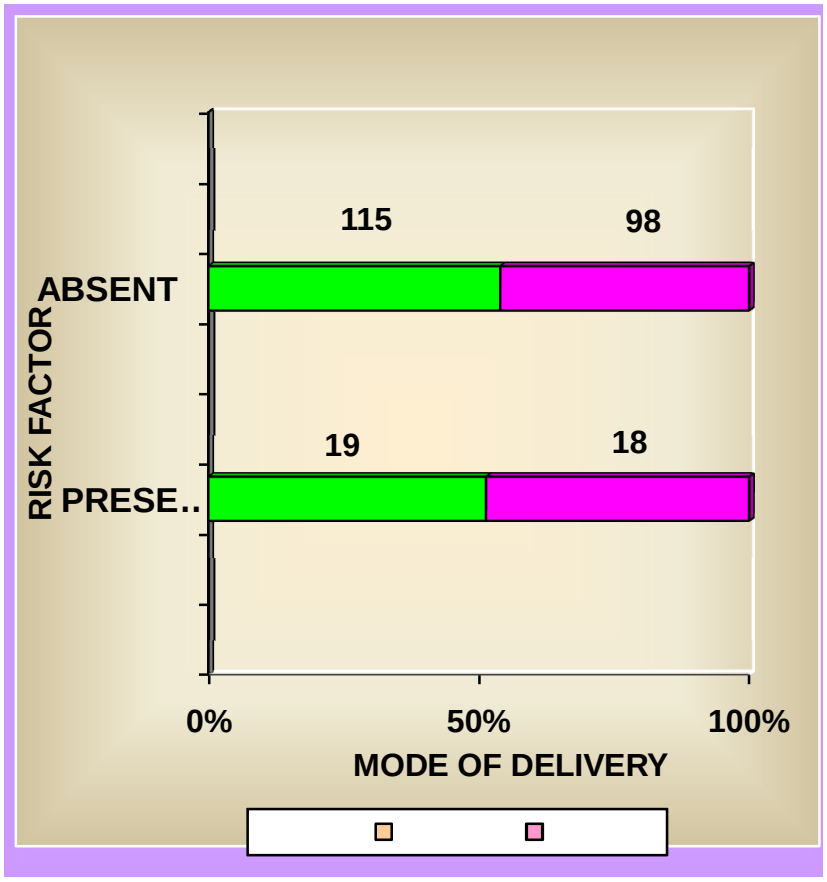


TABLE - 6A : RISK FACTOR AND MODE OF DELIVERY

The presence/absence of risk factors and mode of delivery by vaginal or caesarean section is not statically significant.

Risk factor	Total cases	Mode of delivery			
		Normal delivery		LSCS	
		No.	%	No.	%
Present	37	19	51.4	18	48.6
Absent	213	115	54	98	46
'p'	0.9056 Not Significant				

GRAPH - 6A : RISK FACTORS AND MODE OF DELIVERY



ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

TABLE - 7 : NON STRESS TEST

All women included in our study NST is reassuring before induction.

Non stress test	Cases	
	No	%
Reassuring	250	100
Others	0	0
Total	250	100

TABLE - 8 : AMNIOTIC FLUID INDEX AND BISHOPS SCORE

Parameter	Amniotic fluid index	Bishop score
Range	2-17	0-4
Median	8	3
Mean	8.41	2.74
SD	2.5	1.2

The average bishop score of women undergoing induction in our study group is 2.74 and amniotic fluid index is 8.41.

GRAPH - 8A : AMNIOTIC FLUID INDEX/ BISHOP'SCORE

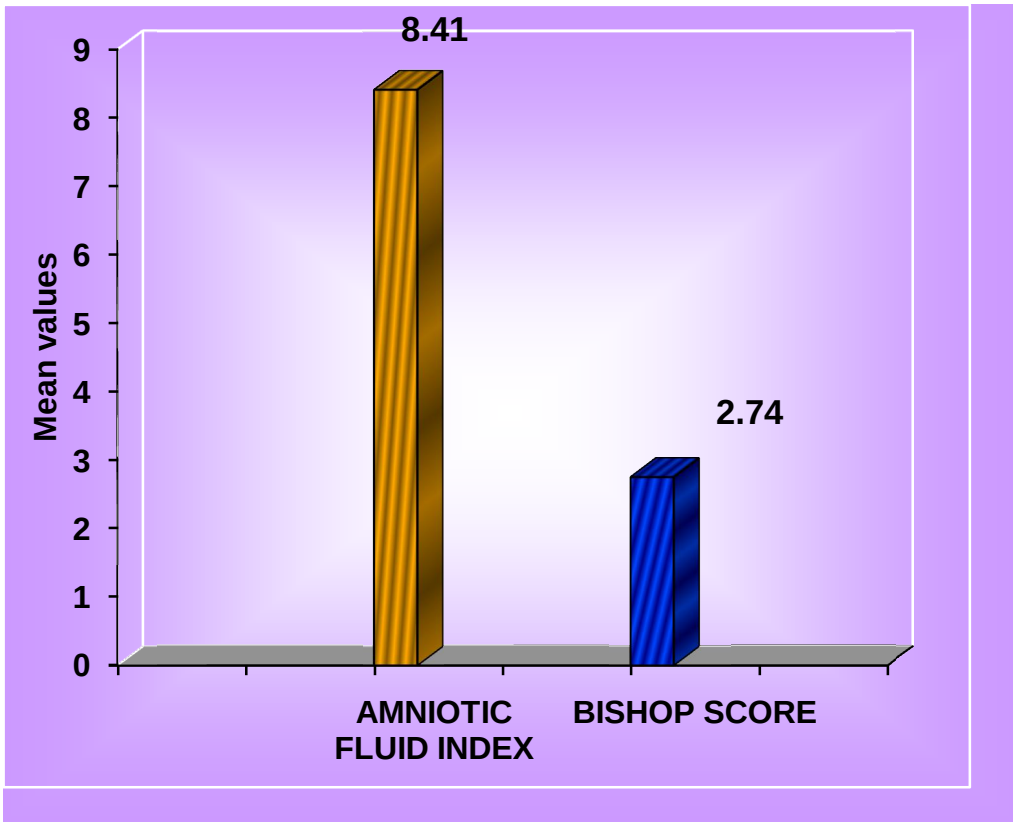


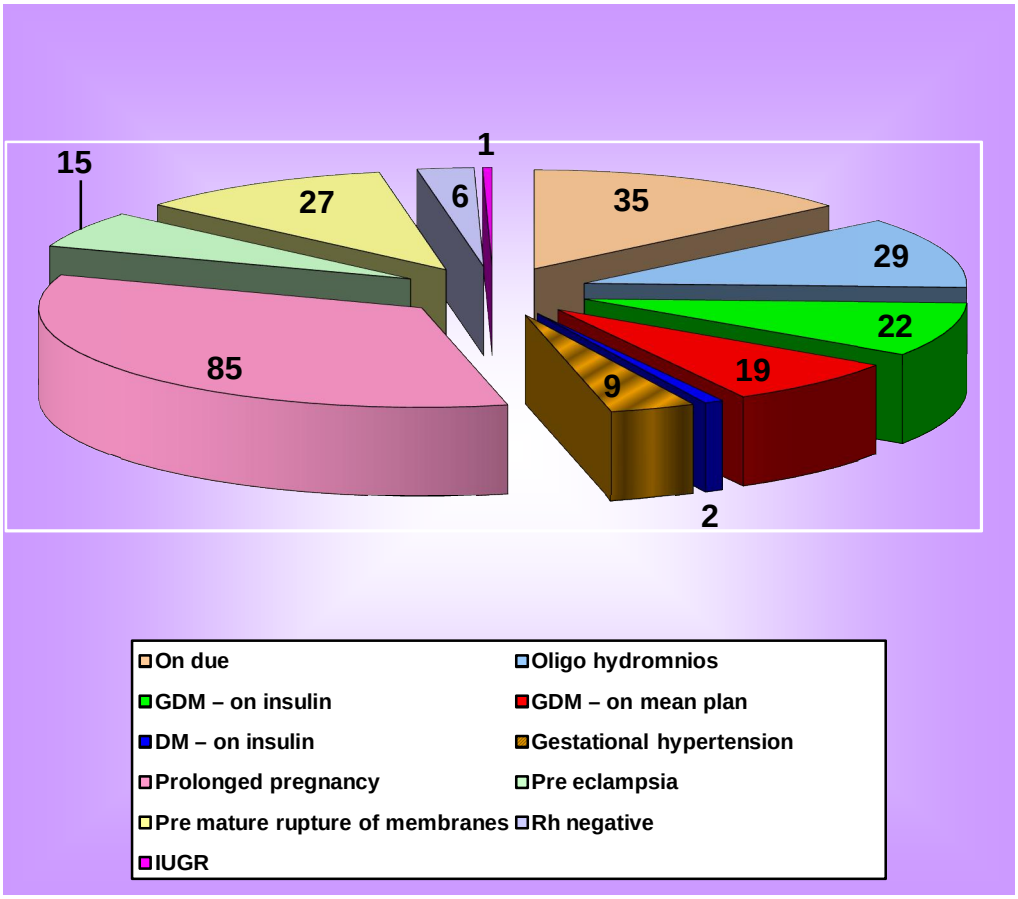
TABLE - 8B : BISHOP SCORE AND MODE OF DELIVERY

Bishop Score	Total cases	Mode of delivery			
		Normal delivery		LSCS	
		No.	%	No.	%
0	15	2	13.3	13	86.7
1	28	3	10.7	25	89.3
2	49	14	28.6	35	71.4
3	74	46	62.2	28	37.8
4	84	69	82.1	15	17.9

TABLE – 9 : INDICATION FOR INDUCTION

Indication for induction	Cases	
	No	%
On due	35	14.0
Oligo-hydromnios	29	11.6
GDM – on insulin	22	8.8
GDM – on mean plan	19	7.6
DM – on insulin	2	0.8
Gestational hypertension	9	3.6
Prolonged pregnancy	85	34.0
Pre-eclampsia	15	6.0
Pre mature rupture of membranes	27	10.8
Rh negative	6	2.4
IUGR	1	0.4
Total	250	100

GRAPH – 9 : INDICATION FOR INDUCTION



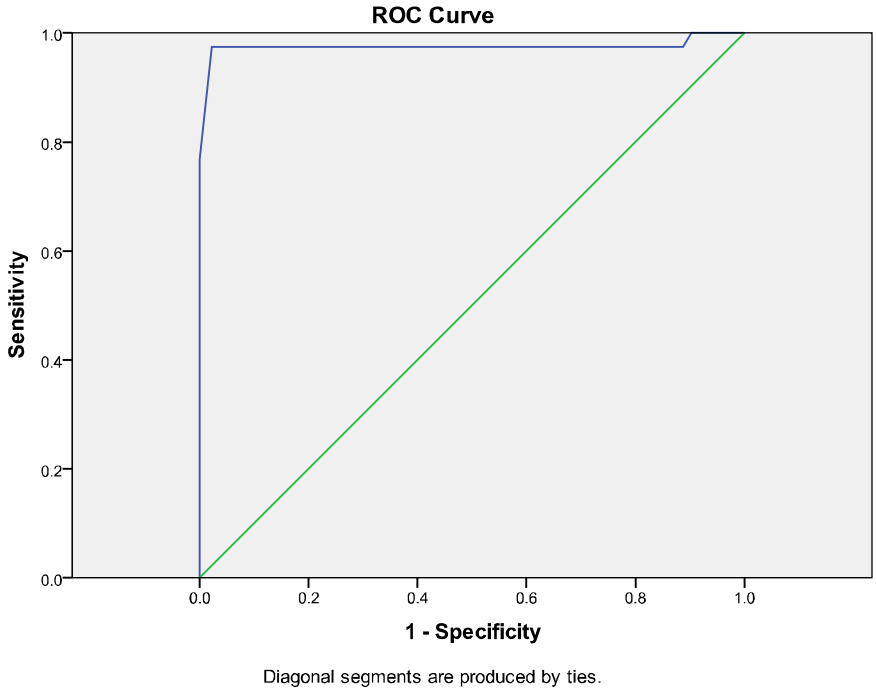
RECEIVER OPERATING CHARACTERISTIC CURVE (ROC) TO FIND OUT CUT OFF VALUES OF TRAN'S VAGINAL CERVICAL LENGTH FOR NORMAL DELIVERIES

Case Processing Summary

Mode	Valid n (listwise)
Positive	116
Negative	134

Larger values of the test result variable(s) indicate stronger evidence for a positive actual state.

a. The positive actual state is LSCS



Diagonal segments are produced by ties.

COORDINATES OF THE CURVE

Test Result Variable(s) : Trans vaginal cervical length with 97.4 Sensitivity and 97.8 Specificity.

Positive if Greater Than or Equal To[a]	Sensitivity	1 – Specificity
.500	1.000	1.000
1.550	1.000	.993
1.650	1.000	.985
1.750	1.000	.978
1.850	1.000	.970
1.950	1.000	.955
2.050	1.000	.903
2.150	.974	.888
2.250	.974	.828
2.350	.974	.776
2.450	.974	.590
2.550	.974	.537
2.650	**.974**	**.022**
2.750	.767	.000
2.850	.681	.000
2.950	.586	.000
3.050	.491	.000
3.150	.379	.000
3.250	.155	.000
3.350	.103	.000
3.450	.052	.000
4.500	.000	.000

Area Under the Curve

Test Result Variable(s): Trans vaginal cervical length

Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
.975	.013	.000	.948	1.000

For 97.5% of the cases included in the Study, the Trans vaginal cervical length was less than the ROC cut of value (2.65 cm) for the normal deliveries and more than the cut off value for the LSCS cases.AUC=0.975.

TABLE – 10 : TRAN'S VAGINAL CERVICAL LENGTH

Trans vaginal cervical length	Cases	
	No	%
<2.65 cm	134	53.6
>2.65 cm	116	46.4
Total	250	100
Range	1.5 – 3.5 cm	
Mean	2.71 cm	
SD	0.38 cm	

GRAPH : 10 - TRANSVAGINAL CERVICAL LENGTH AND MODE OF DELIVERY

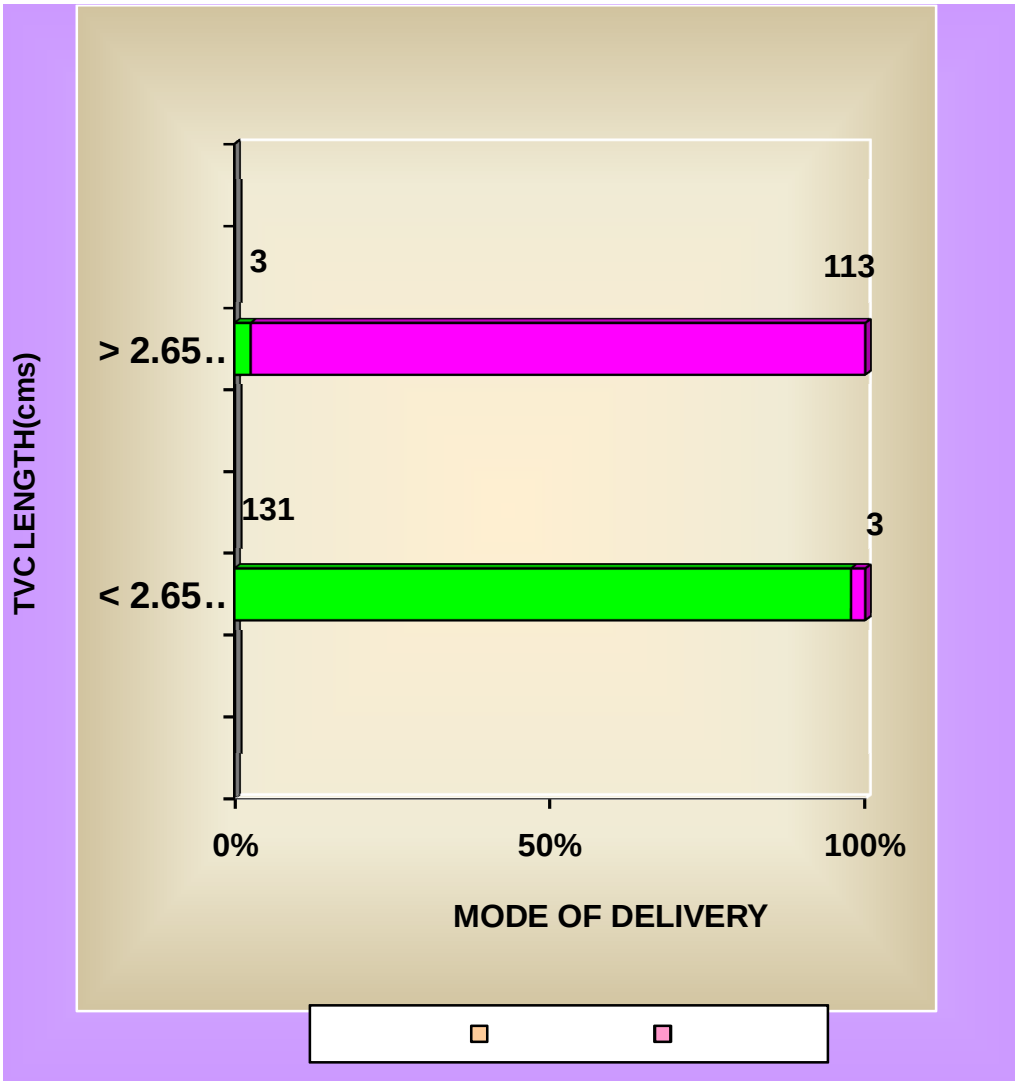


TABLE - 10A: TRAN'S VAGINAL CERVICAL LENGTH AND MODE OF DELIVERY

(Cut off value as per ROC Curve)

Trans vaginal cervical length (cut off value as per ROC curve)	Total cases	Mode of delivery			
		Normal delivery		LSCS	
		No.	%	No.	%
< 2.65 cm	134	131	97.8	3	2.2
>2.65 cm	116	3	2.6	113	97.4
'p'	< 0.0001 Significant				

GRAPH - 10A: TRAN'S VAGINAL CERVICAL LENGTH AND MODE OF DELIVERY

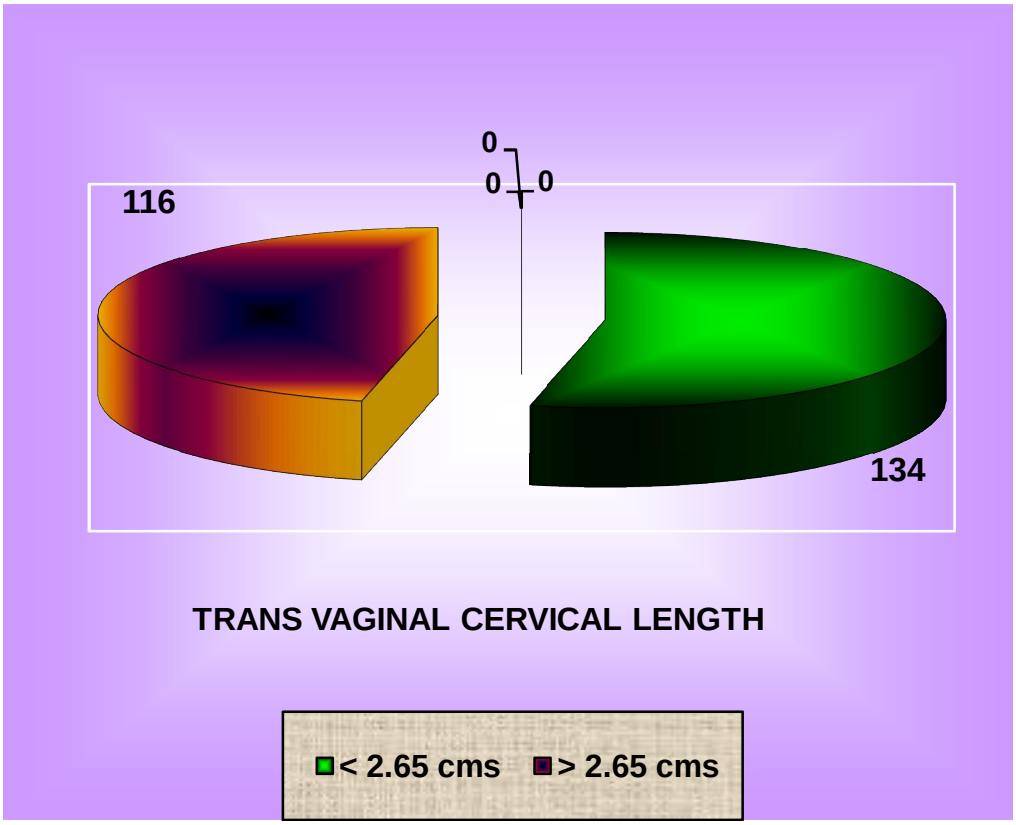


TABLE – 11 : INDUCTION DELIVERY INTERVAL

The mean induction delivery interval in our study is 20 hours (2.2-73.2 hours).

Induction delivery interval	Cases	
	No	%
0-24 hours	177	70.8
24- 48 hours	58	23.2
48-72 hours	15	6
Range	2.2 – 73.2 hours	
Mean	20.1 hours	
SD	15.0 hours	

TABLE - 11A : INDUCTION TO DELIVERY INTERVAL

Duration of delivery	Duration				
	Normal deliveries		LSCS deliveries		'p'
	Mean	S.D.	Mean	S.D.	
Latent phase	13.1	9.3	25.2	17.9	<0.0001 Significant
Active phase	126.4	96	131.1	68	0.5507 Not significant

GRAPH - 11: INDUCTION TO DELIVERY INTERVAL

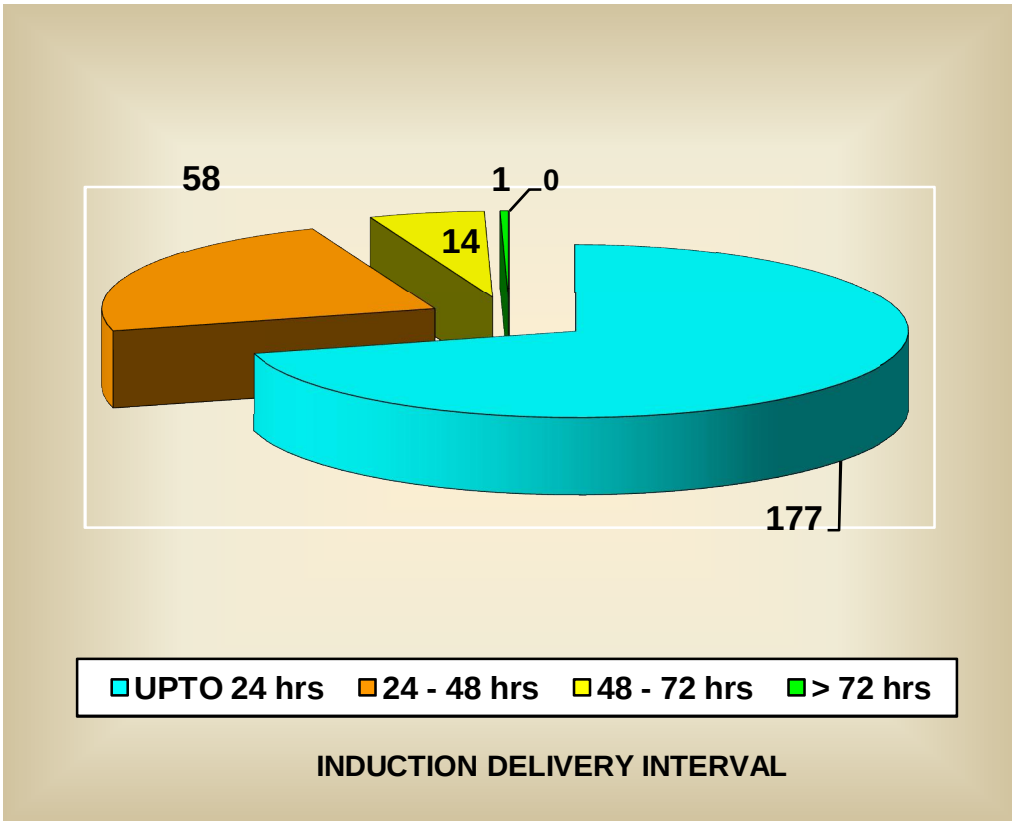


TABLE – 12 : NUMBER OF DOSES OF PGE2 GEL AND MODE OF DELIVERY

Number doses of PGE2 gel	Total cases	Mode of delivery			
		Normal delivery		LSCS	
		No.	%	No.	%
1	119	77	64.4	42	35.6
2	76	47	61	30	39
3	55	11	20	44	80

TABLE - 12A : NUMBER OF DOSES OF PGE2

Maximum number of women in our study group one gel is used (47.6%)

Number of doses of PGE2 gel	Cases	
	No	%
1	119	47.6
2	76	30.4
3	55	22.0
Total	250	100

GRAPH : 12 - NUMBER OF DOSES OF PGE2 GEL

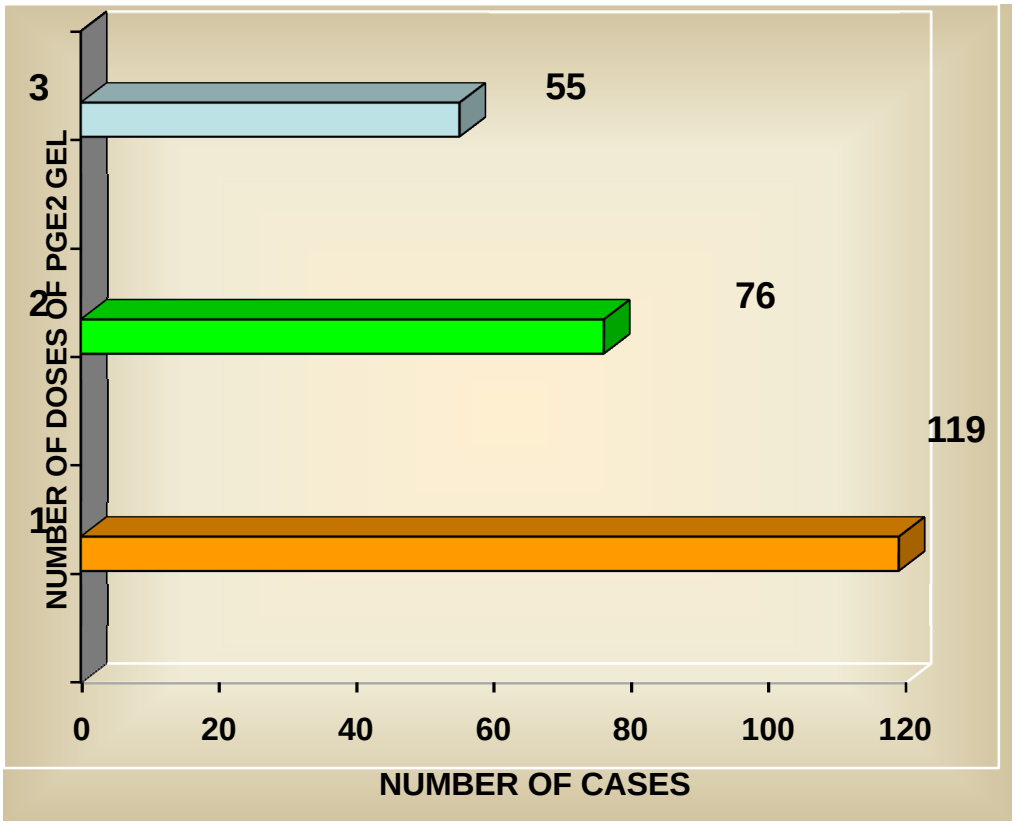


TABLE – 13 : MODE OF DELIVERY

Mode of delivery	Cases	
	No	%
LSCS	116	46.4
Normal vaginal delivery	103	41.2
Vacuum	20	8.0
Forceps	11	4.4
Total	250	100

GRAPH - 13: MODE OF DELIVERY

In our study 53.6% of women delivered vaginally and 46.4% delivered by LSCS.

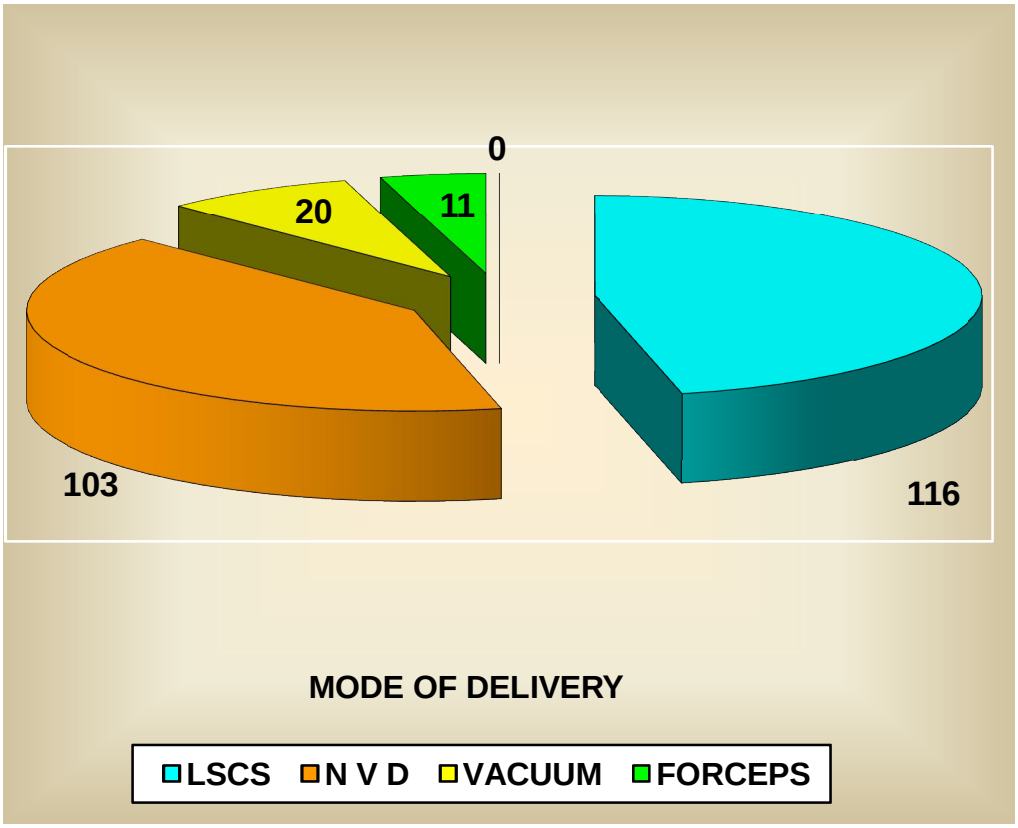


TABLE – 14 : INDICATION FOR LSCS

In our study the maximum number of women underwent LSCS for fetal distress (50%)

Indication for LSCS (n =116)	Cases	
	No	%
Fetal distress	58	50
Failed induction	39	33.6
Meconium stained liquor	6	5.2
Non progression of labor	3	2.6
Protracted Descent	3	2.6
PROM	2	1.7
Others	5	4.3
Total	116	100

GRAPH – 14 : INDICATION FOR LSCS

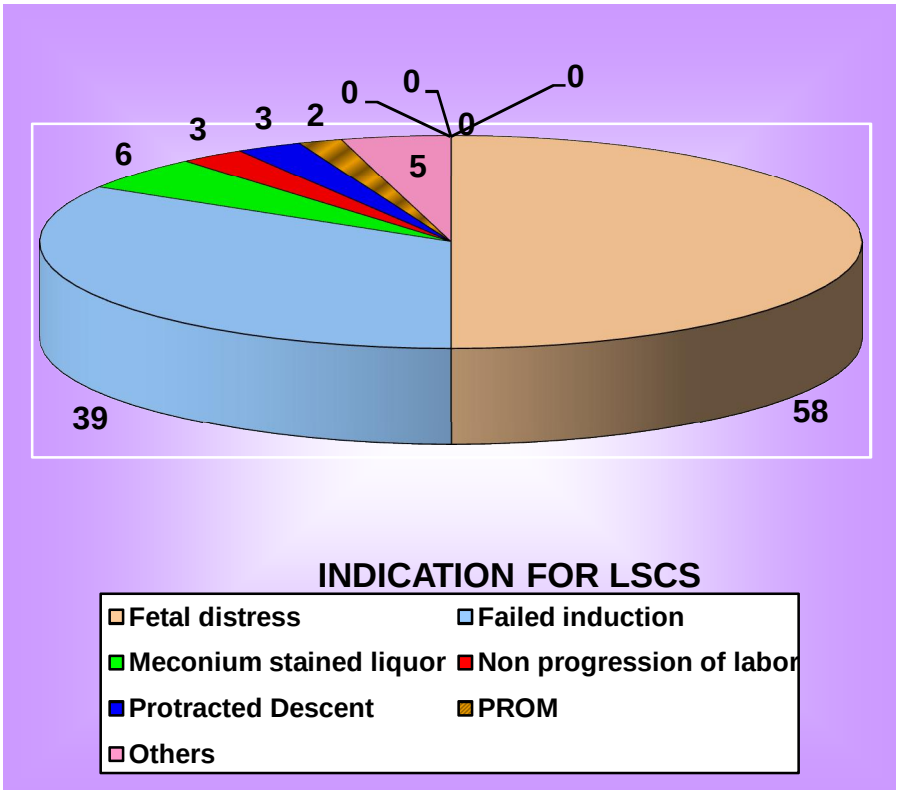


TABLE - 15 : COMPLICATIONS OF PGE2 GEL

The most common complication in our study group is postpartum hemorrhage (11%)

Complications of PGE2 Gel	Cases	
	No	%
Complete perineal tear	1	0.4
Manual removal of placenta	3	1.2
Para-urethral tear	1	0.4
Post-partum hemorrhage	11	4.4
Pre mature rupture of membranes	1	0.4
Sphincter injury(External anal sphincter)	1	0.4
Tachy–systole	1	0.4
Total cases with complications	19	7.6
Total cases without complications	231	92.4
Total	250	100

GRAPH – 15 : COMPLICATIONS OF PGE2 GEL

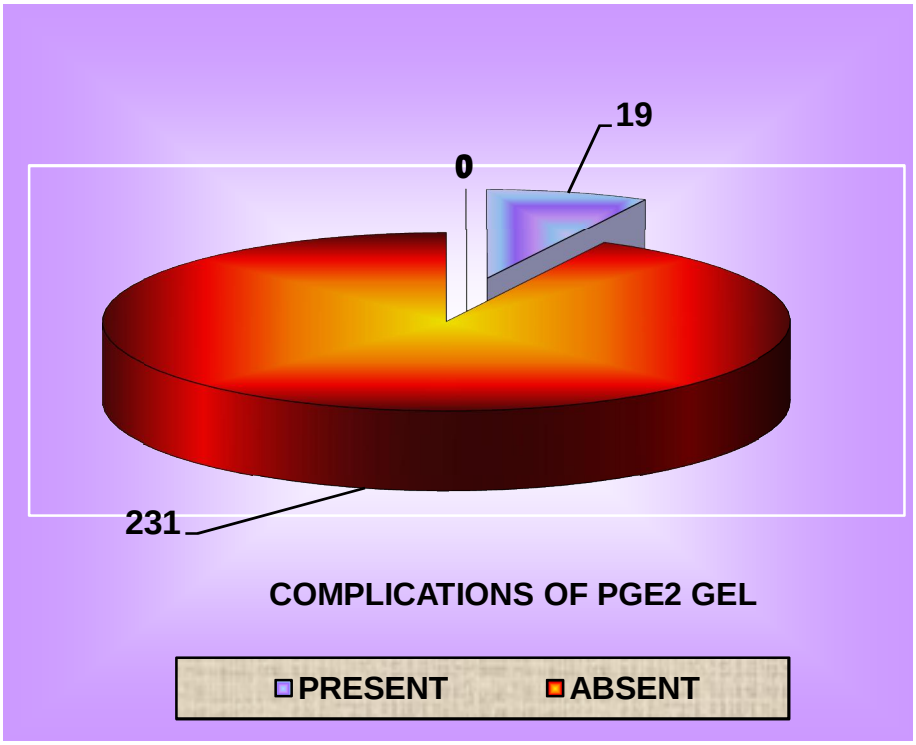


TABLE – 16 : BIRTH WEIGHT

The average birth weight of baby in our study group is 2.69 kg.

Birth weight	Cases	
	No	%
<2.5 kg	18	7.2
≥2.5 kg	232	92.8
Range	1.72 - 4 kg	
Mean	2.69 kg	
SD	0.37 kg	

GRAPH – 16 : BIRTH WEIGHT

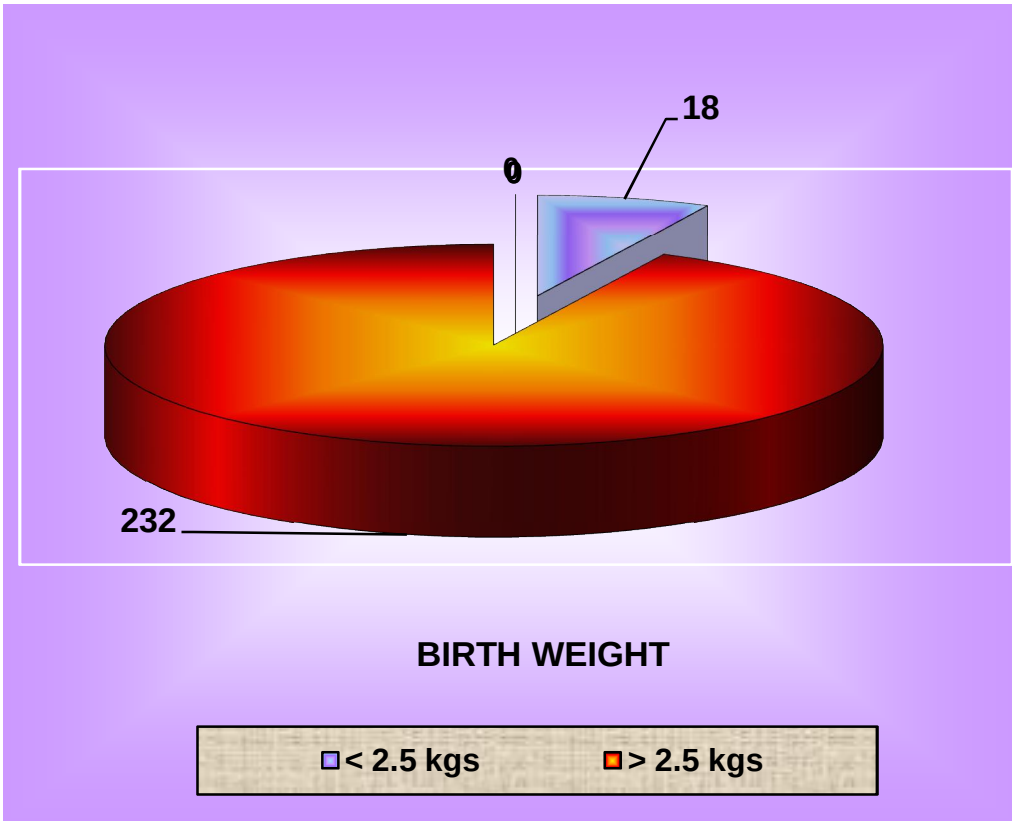


TABLE – 17 : APGAR SCORE

The maximum number of babies in our study group had good APGAR of 8/10 (81.6%)

Apgar score	Cases	
	No	%
6/10	5	2.0
7/10	39	15.6
8/10	204	81.6
9/10	2	0.8
Total	250	100

GRAPH – 17 : APGAR SCORE

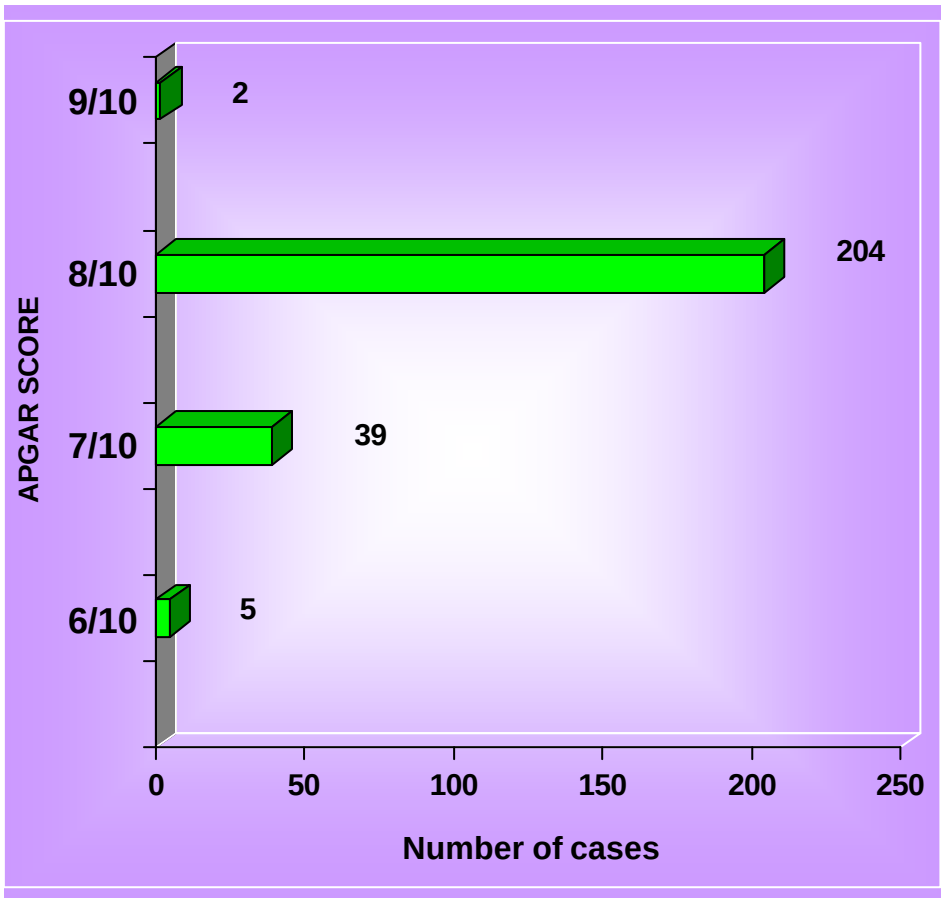


TABLE - 18 : COMPLICATIONS OF BABY

The most common complication for neonate in our study group is meconium stained amniotic fluid (10.4%)

Complications of baby	Cases	
	No	%
Meconium Stained Amniotic fluid	26	10.4
Respiratory distress	12	4.8
IUGR	9	3.6
Infant of diabetic mother	8	3.2
TTN	5	2.0
HIE	3	1.2
Other complications	5	2.0
Total cases with complications	68	27.2
Total cases without complications	182	72.8
Total	250	100

TABLE – 19 : NICU ADMISSIONS

Rate of NICU admission in our study group is 22%.

NICU admissions	Cases	
	No	%
Yes	55	22
No	195	78
Total	250	100

GRAPH - 19 : NICU ADMISSION

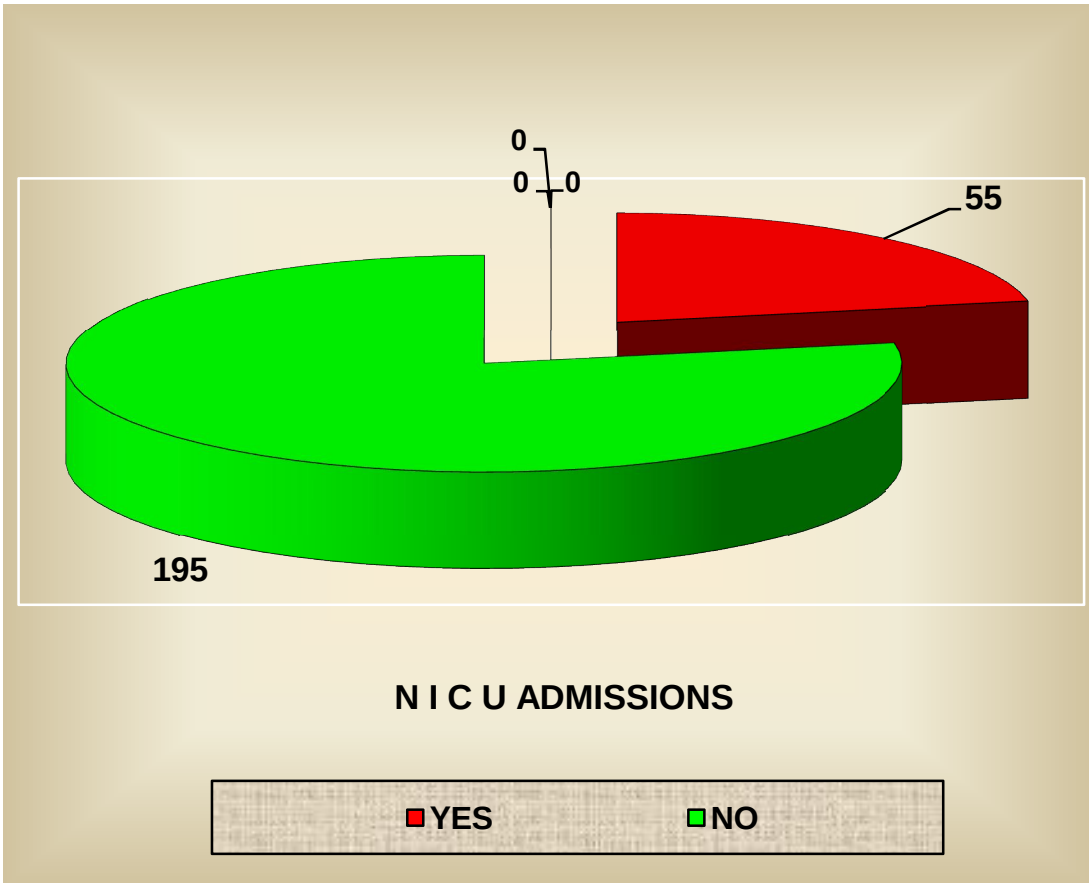
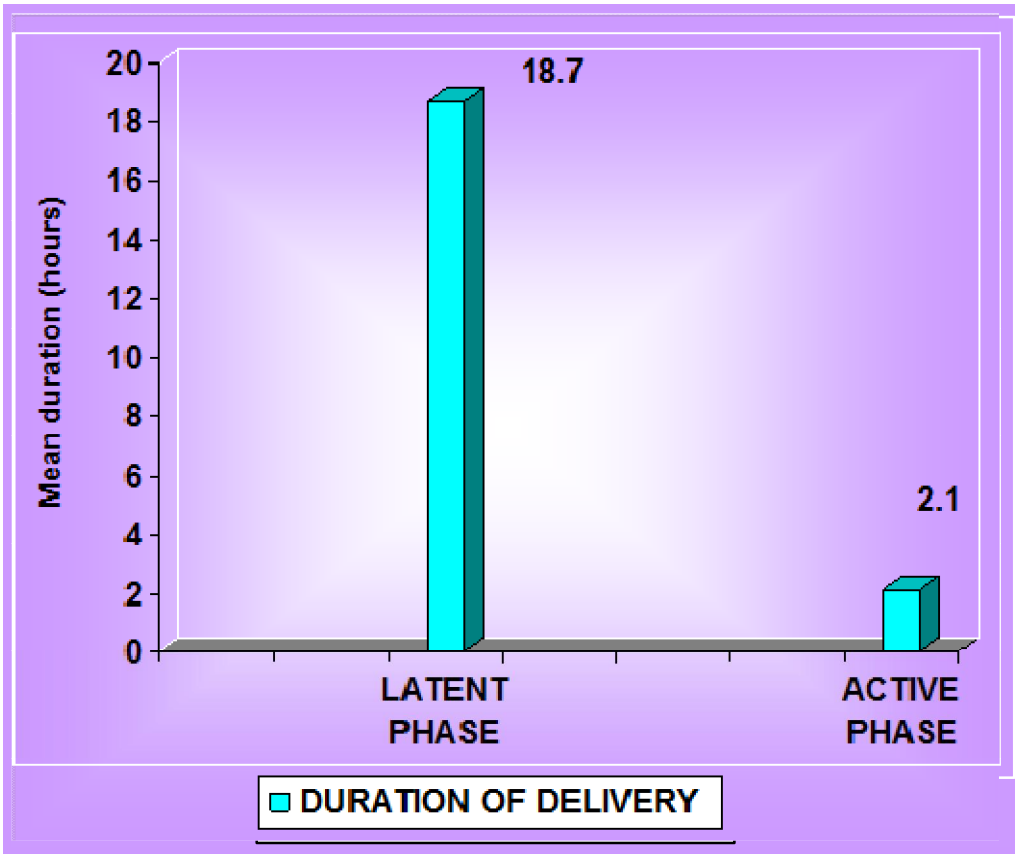


TABLE – 20 : DURATION OF DELIVERY

The mean latent phase duration is 18.7 hours and active phase duration is 2.1 hours

Variables	Duration (in hours)		
	Range	Mean	SD
Latent phase	0.75 - 72.2	18.7	15.2
Active phase	0.25 – 14	2.1	1.5

GRAPH - 20: DURATION OF DELIVERY



DISCUSSION

In our study group, women undergoing induction of labour are at 37-42 weeks of gestation. The mean gestational age of induction in our study is 39.5 weeks (Range 37-40 weeks). PANDIS et al[66] conducted study to predict successful vaginal delivery before induction by measuring trans-vaginal cervical length before induction. Here mean gestational age is 41 weeks (range from 37-42 weeks).

Among 250 women in our study 164(65.9%) are nulliparae and 86(34.1%) are multiparae.

Indications for induction in our study:

Prolonged pregnancy (n=85)
On due date (n=35)
Oligo-hydramnios (n=29)
Pre labour rupture of membranes (n=27)
GDM on insulin (n=22)
GDM on meal plan (n=19)
Pre-eclampsia (n=15)
Gestational hypertension (n=9)
Rh negative pregnancy (n=6)
DM on Insulin (n=2)
IUGR (n=1)

MODE OF DELIVERY

In our study 53.6% delivered vaginally and 46.4% by LSCS in 72 hours after induction. The higher rate of LSCS is due to use of continuous fetal heart rate monitoring in induced patients.

ROC CURVE

It was constructed for sonographically measured cervical length and more than 45^0 line indicating significant relationship between variable and successful induction. Area under Curve (AUC) =0.975 and P value is<0.0001 hence statistically significant.

Best cut-off value for prediction of successful vaginal delivery within 72 hours of induction in our study is 2.6 cm with 97.4%sensitivity and 97.8% specificity. Pandis et al[66] studied 240 women and measured trans-vaginal cervical length to predict successful labour induction.ROC curve analysis was done and proved cervical length is better predictor with sensitivity of 87% and specificity of 71% for length of <2.8cm.

Soong Ha et al[67] studied 105 women and trans-vaginal ultrasonography done for cervical assessment and concluded that trans-vaginal cervical length is an independent predictor of successful labour induction with sensitivity of 75% and specificity of 83% for length of <3cm.

* Ibrahim et al[68] studied 120 women and concluded that cervical length measured trans-vaginally is less in women delivered vaginally than those delivered by LSCS.

* Maitra et al [69] studied 120 women and proved that cervical length measured trans-vaginally before induction is an independent predictor of successful vaginal delivery at<3 cm.

* Keepanasseril et al[70] studied 138 women and concluded that best cut-off point in ROC curve for predicting successful labour induction is 3 cm.

* Limitation is that to obtain trans-vaginal cervical length, equipment is expensive and technical expertise is required for measuring cervical length to avoid errors. In setting where equipment and expertise is available it can be done with minimal discomfort to patient. It can predict successful vaginal delivery and helps in counseling the patient. Cervical length of <2.6 cm have more chance of normal delivery than those with>2.6 cm.

* In our study successful vaginal delivery from

0-24 hours=62.1%.PitarelloPda R. et al[71] study done a study showing 62.6% showing normal deliveries within 24 hours of induction.-

24-48 hours = 39.7%

48-72 hours = 6.7%

In our study LSCS

0-24 hours = 37.9%

24-48 hours = 60.3%

48-72 hours = 93.3%.

In our study 62.1% delivered normally within 24 hours of induction. The number of normal deliveries decreases as induction delivery interval increases. The number of caesarean deliveries increases as induction delivery interval increases.

DURATION OF LATENT PHASE

The mean duration latent phase in our study is 18.7(range 0 .75 to 72.2 hours) hours and mean duration of active phase of labour is 2.1 hours (range 0.25-14hrs).

Soon Ha et al have done a study to evaluate value of trans-vaginal cervical length in prediction of outcome of labour induction. The mean duration of latent phase of labour was 15.3 hours (range 1to 60 hours) and the mean duration of active phase of labour is 4.1 hours (1-14 hours).

The component in labour most affected by cervical length during induction is long latent phase.[72]

The mean latent phase duration in women undergoing LSCS in our study is 25.2 hours and in normal vaginal delivery is 13.1hours and its statistically significant ($p<0.0001$) in our study.[73] Alabi et al done a study to determine association between length of labour and mode of delivery longer the duration of latent phase higher the risk of caesarean section.

INDUCTION DELIVERY INTERVAL

The mean induction delivery interval in our study is 20.8 hours. Rane et al done similar study and the induction to delivery interval was 15.5 hours and cervical length measured trans-vaginally have significant effect on induction delivery interval within 24 hours.

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

Boozarjomehri et al[73] measured trans-vaginal cervical length of 53 women before induction and co-related with length of latent phase and it has no significant association with induction to delivery interval..

Soon Ha et al studied 105 women and assessed cervical length trans-vaginally and concluded that cervical length is an independent predictor of successful labour induction and duration of induction.

In our study about 70.8% (62%-vaginal deliveries) delivered within 24 hours of induction and as the induction delivery interval increases number of normal deliveries decreases and LSCS increases and the association is statistically significant (P value<0.0001).

LIMITATIONS OF THE STUDY

1. Our study involved both nulliparous and multiparous women.
2. Other parameters of trans-vaginal cervical assessment like funneling, cervical angle and dilatation are not included. These parameters are also predictors of successful vaginal delivery.

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

CONCLUSION

Trans-vaginal cervical length can be used to predict successful vaginal delivery in the setting where appropriate equipment and expertise are available. Thus the traditional method of assessing the favorability of cervix can be replaced by trans-vaginal cervical measurement and add yet another dimension in field of obstetrics

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

SUMMARY

The main objective of the study is pre-induction trans-vaginal sonographic measurement of cervical length in prediction of successful vaginal delivery.

It is a prospective observational study done in 250 women with gestational age ranging from 37-42 weeks of gestation. Cervical length is measured before induction by trans-vaginal ultrasound. Both primi and multigravida are included in our study. Induction with PGE2 gel is done. Results are analyzed with ROC curve, the cut-off value predicting successful vaginal delivery is 2.6cm with sensitivity of 97.4% and specificity of 97.8% within 72 hours of induction.

BIBLIOGRAPHY

1. F.Gary Cunningham, Kennethj. Leveno ,Steven L. Bloom, Jhon C. Hauth, Dwight J. Rouse, Catherine Y. Spong - Williams obstetrics - 23 rd edition : 22;500.

2. RCOG. Induction of labour. In Evidence based clinical guideline Number 9 London: RCOG Clinical support unit, 2001.

3. Cole RA, Howie P W, Magnaughton M C. Elective induction of labour. A randomized prospective trial Lancet 1975; 1: 767-70

4. Sande H A, Tuveng J, Fontelien T A. Prospective randomized study of induction of Labour Int J Gynaecol Obstet 1983; 21: 333-6

5. Sue-A-Quan AK, Hannah M E, Cohen M M, Foster G A. Effect of labour induction on Rates of still birth and Cesarean Section in post term pregnancies CMAJ 1999; 160:1145-9 Clinical Obstet and Gynecol 1990; 163: 859-67

6. William F, O' Brien. Cervical ripening and labor induction.

7. Andersen HF et al. Prediction of risk of preterm delivery by ultrasonographic Measurement of cervical length. Am J Obstet Gynecol 1990; 163: 859- 6

8. O'Connell MP, Avis NJ, Brown BH, Killick SR and Lindow SW2003- Electrical impedance measurements: an objective measure of prelabour cervical changes. Journal of maternal foetal and neonatal medicine 14:389-391.

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

9. Pandis GK, Papageorghiou AT, Ramanathan VG, Thompson MO, Nicolaides KH Preinduction sonographic measurement of cervical length in the prediction of successful induction of labour Ultrasound Obstet Gynecol. 2001 Dec; 18(6):623-8.

10. Soon Ha Yang, MD, Cheong Rae Roh, MD, Jong Hwa Kim, MD, PhD Transvaginal Ultrasound for Cervical Assessment before Induction of Labor. Seoul, South Korea. Revised manuscript accepted for publication September 24, 2003.

11. Ibrahim A. Abdelazim1*, Mohannad Lutfi Abu faza. Sonographic assessment of the cervical length before induction of labor. Asian Pacific Journal of Reproduction 2012; 1(4): 253-257.

12. Rane SM, Guirgis RR, Higgins B, Nicolaides KH. Models for the prediction of successful induction of labor based on pre-induction sonographic measurement of cervical length.

13. Maitra N, Sharma D, Agarwal S. Transvaginal measurement of cervical length in the prediction of successful induction of labour. J Obstet Gynaecol. 2009 Jul; 29(5):388-91

14. Keepanasseril A, Suri V, Bagga R, Aggarwal N. Pre-induction sonographic assessment of the cervix in the prediction of successful induction of labour in nulliparous women. Aust N Z J Obstet Gynaecol. 2007 Oct; 47(5):389-93.

15. S. M. RANE*, G. K. PANDIS*, R. R. GUIRGIS†, B. HIGGINS‡ and K. H. NICOLAIDES Pre-induction sonographic measurement of cervical length in prolonged pregnancy: the effect of parity in

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

the prediction of induction-to-delivery interval. Aust N Z J ObstetGynaecol. 2007 Oct; 47(5):389-93

16. Parvin Bastani, Kobra Hamdi, Fatemeh Abasalizadeh, Parisa Pourmousa, FatemehG hatrehsamani Transvaginal ultrasonography compared with Bishop Score for predicting cesarean section after induction of labor. Women's Reproductive Health Research Center, Tabriz University of Medical Sciences, Tabriz, Iran. International Journal of Women's Health 01/2011; 3:277-80.

17. Tan PC, Vallikkannu N, Suguna S, Quek KF, Hassan J Ultrasound in obstetrics & gynecology: the official journal of the International Society of Ultrasound in Obstetrics and Gynecology 29:5 2007 May pg 568-73.

18. Nahed H. Mohamed, Naglaa H. Mohamed and Mahmoud A. Mansour* Transvaginal Ultrasonographic Cervical Assessment as a Predictor of Successful Labor Induction. The Egyptian Journal of Hospital Medicine Vol. 1, 48 -59, Rec. Nov. 2000, Dec.2000.

19. Yun Sung Jo, Gui Se Ra Lee, Narinay Kim, Dong Gyu Jang, Sa Jin Kim, Young Clinical Efficacy of Cervical Length and Volume for Prediction of Labor Onset in VBAC Candidates Int J Med Sci 2012; 9(9):738-742.

20. Shafik A, Abou-Seeda M and Meligy M Validity of Sonographic Cervical Length Measurement and Cervical Funneling in rediction of Spontaneous Onset of Labor at Term Pregnancy Life Science Journal 2012; 9(1s).

21. Ware V, Raynor BD Transvaginal ultrasonographic cervical measurement as a predictor of successful labor induction. American Journal of Obstetrics and Gynecology [2000, 182(5):1030-1032]

22. Rane, S. M.[1]; Pandis, G. K.[1]; Guirgis, R. R.[2]; Higgins, B.[3]; Nicolaides, K. H.[1] Cervical length and induction-to-delivery interval Volume 22, Number 1, 1 July 2003, pp. 40

23. StempeJE, Prins RP, Dean S. Preinduction cervical ripening: a randamised prospective comparison of the safety and efficacy of intravaginal and intracervical PGE2 GEL. Am. j. obstet Gynecol.1997 jun; 176(6):1305-9.

24. L sahlin, H.Wang, Y.Stjernholm, M.Lundberg, G.Ekman, A.Holmgren, H.Eriksson. The expression of glutaredoxin is increased in the human cervix in term pregnancy and immediately postpartum, particularly after PG –induced delivery.

25. A. Fruscalzo, AP Londero, C. Frohlich, R. schmitz. Diagnostic accuracy of quatitative elastography of the cervix in the prediction of successful labour induction: Comparasion with Bishop's score and ultrasound cervical length. Ultraschall in med 2012; 33 –A703.

26. Wendy Despain. Ultrasound beats Bishop's score at predicting labour induction success. Article of psychiatric times; july 2007.

27. Ulmsten U, Wingerup L, Belfrage P, Ekman G, Wiqvist N. Intra-cervical application of Prostaglandin gel for induction of term labour. Obstet Gynecol. 1982 Mar; 59(3):336-9.

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

28. Almstorm H, Ekman G, Granstorm L. Preinduction cervical ripening with PgE2 gel in term pregnant women with ultrasonically diagnosed intra-uterine growth retarded foetuses. Acta Obstet Gynecol.1991; 70(7-8): 555-9.

29. Silva –Curz A, Pinto JM, Tavares JM, Valerio O, Cardoso C. PGE2 gel for enhancement of priming and induction of term in patients with unfavourable cervix. Eur J Obstet Gynecol Reprod Biol. 1985 Dec; 20(6): 331-6.

30. S. Norchi, A.Zanini, A.L.Regalia, A.Polini, A.Silva. Cervical priming and labour induction by multiple doses of intracervical prostaglandin E2 gel. Article. Department of O&G; Italy: Copyright in 1992 published by Elsevier Ireland Ltd.

31. FaziaRaza, Saeeda Majeed. Intracervical PGE2 gel for cervical ripening and induction of labour. Pak J Med Sci.April- june 2008(PART –I) Volumle 24; 241-245.

32. Puliyath Geetha. Induction of labour with prostaglandin E2 vaginal gel in women with previous one caesarean section. Middle East Fertility society Journal. Volume 17; sep 2012:170-175.

33. Bhatnagar, Kriti, Sharma, Usharani, Manjul. Safety and efficacy of PGE2 gel (cerviprime) for induction of labour in term prelabour rupture of membranes, with special reference to its feto-maternal complications. Indian journal of public heaithresearch& Development; Jan 2011, vol.2:128.

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

34. HS Warke, RM Sarogi, SM Sanjwalla. Prostaglandin E2 gel in ripening of cervix in induction of labour. Original article 1999; volume 45; 105-9.

35. Ahmed Akram, Ishapatel, Selvakumari, Anandhi. Clinical observation of dinoprostone to induce labour in post-datism-success, side-effects and acceptability;IJMPS:2013;3(8):14-21.

36. Mika Nuutila, Paul Kajonaja. Cervical ripening prior to labour induction with intra-cervical PGE2 gel in patients with pre-eclampsia. A placebo controlled study. Original article ;1995;vol 14:313-314.

37. J. Dommise, J.M. Wild. Assessment of a new PGE2 gel in labour induction.Samj.vol11;18 april1987.

38. F.Gary Cunningham, Kennethj. Leveno ,Steven L. Bloom, Jhon C. Hauth, Dwight J. Rouse, Catherine Y. Spong -Williams obstetrics -23 rd edition ;chapter 2:23.

39. YuSY, leppert PC. The collagenous tissues of cervix during labour and delivery. leppert PC, Woessner JF Jr, eds. The extracellular matrix of the cervix, uterus, foetal membranes: synthesis, degradation and Hormonal regulation. Ithaca NY; Perinatology press; 1991:68-76.

40. Sabaratnam Arulkumaran, Gita Arjun, Leonie Penna: The management of labour –Third edition; 22:358.

41. F.Gary Cunningham, Kennethj. Leveno, Steven L. Bloom, Jhon C. Hauth, Dwight J. Rouse, Catherine Y. Spong -Williams obstetrics -23 rd edition:6-138.

42. William F O'Brien. Cervical ripening and labour induction. Clinical Obstet and Gynecol.1990; 163:859-67.

43. F.Gary Cunningham, Kennethj. Leveno ,Steven L. Bloom, Jhon C. Hauth, Dwight J. Rouse, Catherine Y. Spong - Williams obstetrics -23 rd edition:6-140.

44. Steven G. Gabbe, Jennifer R. Niebyl, Joe Leigh Simpson, Mark B Landon, Henry L.Galan, Eric R .M. Jauniaux, Deborah A. Driscol. Copyright 2012. Obstetrics –Normal and problem pregnancies. Sixth Edition; 14:298

45. Mova CN, papka RE. The role of sensory neurons in cervical ripening: effects of Estrogen and neuropeptides. J Histochem Cytochem.2004 ;52:1249-1258.

46. Van A, et al. Fluorescence Assay in biology and medicine. Vol 1. New York Academic press: 1962.

47. Maul H Oslon G, Fitkow CT, et al. Cervical length induced fluorescence in humans decreases throughout gestation and before delivery. Preliminary observation. Am J Obstet Gynecol. 2003; 188:537-541.

48. Belew C.Herba and childbearing woman. Guidelines for midwifes. J Nurse midwifery1999;44:205-216.

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

49. Adair CD . Nonpharmacologic approaches to cervical ripening and labour induction. Clin Obstet Gynecol 2000;43:447-54.

50. Smith CA,Crowther CA.Acupuncture for induction of labour. Cochrane Database sys Rev 2002;2: CD 002962)

51. Lin A, Kupferminc M, Dooley SL. A Randomised trial of extra-amniotic saline infusion versus laminaria for cervical ripening. Obstet Gynecol 1995;86 (4 part 1) :545-9.

52. Sanchez –Ramos L, Kaunitz AM.Misoprostol for cervical ripening and labour induction.a systemic review of literature. Clin Obstet Gynecol 2000; 43:475-88.

53. Neilson JP. Mifepristone for induction of labour.Cochrane data base.Sys rev 2002; 2: CD 002865.

54. Keirse MNJC ,van Oppen ACC.Comparasion of prostaglandins ano oxytocin for inducing labour. Effective care in pregnancy and childbirth.Oxford university press; 1989: 1080-1111.

55. French L.Oral prostaglandin E2 for induction of labour. Cochrane database sys.rev.2001. Art No.CD00098.

56. Keirse MNJC .Prostaglandins in preinduction cervical ripening. Meta-analysis of world wide clinical experience. J Reprod Med 1993; 38:89-100.

57. Mahmood TA, Rayner A, Smith NC, et al. A randomised prospective trial comparing single dose PGE2 gel with forewater

amniotomy for induction of labour.Eur J Obstet Gynecol Reprod Biol. 1995; 58 : 111-11.

58. Sabaratnam Arulkumaran, Gita Arjun, Leonie Penna: The management of labour –Third edition; 23 :3 68-69).

59. Steven G. Gabbe, Jennifer R. Niebyl, Joe Leigh Simpson, Mark B Landon, Henry L. Galan, Eric R .M.J auniaux, Deborah A.D riscol. Copyright 2012. Obstetrics –Normal and problem pregnancies. Sixth Edition; 14:294.

60. BishopEH.Pelvic scoring for elective induction. Obstetrics and Gynecology.1964;24:266-268.

61. Sabaratnam Arulkumaran, Gita Arjun, Leonie Penna: The management of labour –Third edition; 23:375

62. Burnett JE. Preinduction scoring: An objective approach to induction of labour. Obstet Gynecol.1996; 28:479-483.

63. Fields H .Induction of labour: Readiness for induction. Am J Obstet Gynecol 1996; 95:426-429.

64. Ali Nawaz Khan. Cervical incompetence imaging. Med scape article. Updatedjuly 25, 2013.

65. Deborah A .Wing. Preterm birth prediction and prevention.

66. Pandis GK, Papageorghiou AT, Ramanathan VG, Thompson MO, Nicolaides KH Preinduction sonographic measurement of

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

cervical length in the prediction of successful induction of labor Ultrasound Obstet Gynecol. 2001 Dec; 18(6):623-8.

67. Soon Ha Yang, MD, Cheong Rae Roh, MD, Jong Hwa Kim, MD, PhD Transvaginal Ultrasound for Cervical Assessment before Induction of Labor. Seoul, South Korea. Revised manuscript accepted for publication September 24, 2003

68. Ibrahim A. Abdelazim1*, Mohannad Lutfi Abu faza. Sonographic assessment of the cervical length before induction of labor. Asian Pacific Journal of Reproduction 2012; 1(4): 253-257.

69. Maitra N, Sharma D, Agarwal S. Transvaginal measurement of cervical length in the prediction of successful induction of labour. J Obstet Gynaecol. 2009 Jul; 29(5):388-91

70. Keepanasseril A, Suri V, Bagga R, Aggarwal N. Pre-induction sonographic assessment of the cervix in the prediction of successful induction of labour in nulliparous women. Aust. N Z J Obstet Gynaecol. 2007 Oct; 47(5):389-93

71. Prediction of successful labour induction using transvaginal cervical length. J Clin ultrasound.2013 Feb;41(2):76-83.

72. KyoHoon Park. Trans-vaginal ultrasonographic cervical measurement in predicting failed labour induction and caesarean delivery for failure to progress in Nulliparous women. Journal Korean medicine science; 2007 Aug; 22(4):722-727.

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

73. L.Alabi –isama. The association between length of labour and mode of delivery and neonatal outcomes in women undergoing induction of labour. Ultrasound in O&G 2011;38:168-281.

74. Boozarjomehri. Trans vaginal ultrasonographic evaluation of the cervix before labour. Presence of cervical wedging is associated with shorter labour. Obstet and Gynecol;1994:1081-7.

J¨¦uÀ£i Á®

©¸zxÁ ÷©Ø£i¨¦ B´ÄUPõP ö\´¯¨£k® C¢u £¶÷\õuøÚ°À £[Sö£Ó ¬Ê©Úxhß {õº \®©vUQ÷Óß. C¢u £¶÷\õuøÚ°À GÚUS AiÁÈ¯õP ì÷Pß ö\´x _P¨¤µ\® BS® Áõ´¨¦PÒ EÒÍuõ Gß£øu AÔ¢x öPõÒÍ GÚUS \®©u®. ÷©¾® ¤µ\Á Á¼Á¸ÁuØS Ai ÁÈ¯õP©¸¢x øÁUPÄ®GÚUS \®©u®.

CuÚõÀ G¢u ¤ßÂøÍÄPÒ HØ£hõx Gß£øu²® C¢u £¶÷\õuøÚUPõPG¢uPmh n ¬®Á`¼UP¨£hõx Gß£øu©¸zxÁº »®AÔ¢x öPõs ÷hß.

Signature of Investigator

Signature of the Participant

WITNESS :

ABBREVIATIONS

OBS.SCORE	-	OBSTETRIC SCORE
EDD	-	EXPECTED DATE OF DELIVERY
GA	-	GESTATIONAL AGE
LCB	-	LAST CHILD BIRTH
RISK FAC	-	RISK FACTOR
NST	-	NON STRESS TEST
AFI	-	AMNIOTIC FLUID INDEX
BISHOPS	-	BISHOPS SCORE
IOI	-	INDICATION FOR INDUCTION
TVL	-	TRANS VAGINAL CERVICAL LENGTH
NOD	-	NUMBER OF DOSES OF PGE2 GEL
IDI	-	INDUCTION DELIVERY INTERVAL
MOD	-	MODE OF DELIVERY
COM	-	COMPLICATIONS OF PGE2 GEL
B.WT	-	BIRTH WEIGHT
COB	-	COMPLICATIONS OF BABY
NICU	-	NEONATAL INTENSIVE CARE UNIT ADMISSION
LATENT	-	LATENT PHASE

ACTIVE	-	ACTIVE PHASE
MSAF	-	MECONIUM STAINED AMNIOTIC FLUID
MSL	-	MECONIUM STAINED LIQUOR
HIE	-	HYPOXIC ISCHAEMIC ENCEPHALOPATHY
PROM	-	PRE MATURE RUPTURE OF MEMBRANCES
HYPOTHY	-	HYPOTHYROIDISM
PP	-	PROLONGED PREGNANCY
NVD	-	NORMAL VAGINAL DELIVERY
LSCS	-	LOWER SEGMENT CESEREAN SECTION
MAN R OF PLACENTA	-	MANUAL REMOVAL OF PLACENTA
IUGR	-	INTRA UTERINE GROWTH RETARDATION
NPL	-	NON PROGRESS OF LABOR
IDM	-	INFANT OF DIABETIC MOTHER
DM INS	-	DIABETES ON INSULIN
OD	-	ON DUE
OLIGO	-	OLIGOHYDRAMINOS

ABBYY PDF Transformer 2.0 Click here to buy www.ABBYY.com

FD	-	FETAL DISTRESS
PRE ECL	-	PRE ECLAMPSIA
F INDUCTION	-	FAILED INDUCTION
F VENTOUSE	-	FAILED VENTOSE
GEST.HT	-	GESTATIONAL HYPERTENSION
P DESCNT	-	PROCTRACTED DESCENT
CPT	-	COMPLETE PERINEAL TEAR
PPH	-	POST PARTUM HAEMORRAGE
VACUM	-	VACUM DELIVERY
GDM M	-	GDM ON MEAL PLAM
GDM INS	-	GDM ON INSULIN
SC	-	SICKLE CELL TRAIT

S.NO	AGE	IP.NO	OBS SCORE	EDD	GA	HEIGHT	WEIGHT	BMI	LCB	RISK FAC	NST	AFI	BISHOP	IOI	TVL	N.O.D	IDI	MOD	LSCS-IND	COM	B.WT	APGAR	COB	NICU	LATENT	ACTIVE
1	20	638	PRIMI	1/12/2012	40	156	45	20.8		ANAEMIA	R	5	1	OLIGO	3.5	1	11 HRS	LSCS	FD	-	2.7	8 / 10	TTN	AD	11HRS	_
2	20	3165	PRIMI	1/10/2012	40+1	158	57	25.3		PRE-ECL	R	8.8	2	PP	2.6.2.2	2	17 HRS	NVD	_	_	2.9	8 / 10	_	_	16HRS	1HR
3	24	2539	PRIMI	1/28/2012	40	148	52	26.5		_	R	12	4	OD	2.6	1	9. 30 MIN	NVD	_	_	2.8	8 / 10	_	_	7.30MIN	2HRS
4	27	8481	PRIMI	1/27/2012	40+1	158	70	31.1		RH-VE	R	7	4	RH-VE	2.4	1	9.15 MIN	NVD	__	__	3.3	8 / 10	_	_	8.15MIN	1HR
5	26	6334	G2P1L1	1/1/2012	40+1	158	56	24.8	10	_	R	9.5	3	PP	2.4	1	4.30 MIN	NVD	_	PUTEAR	2.9	8 / 10	_	_	3.15MIN	1.15MIN
6	31	7364	G2P1L0	1/9/2012	40	158	52	23.1		PRE-ECL	R	10	4	OD	2.4	1	9.20 MIN	NVD	_	_	2.7	8 / 10	_		8.15MIN	1.5MIN
7	26	2309	G2A1	2/7/2012	38	157	52	23.1		DM_INSU	R	10.5	3	DM - INUS	2.7/2.7/2.6	3	41 HRS	LSCS	FINDUCTN		2.9	7 / 10	_	_	41HRS	_
8	30	1617	G4P2L2E1	1/19/2012	40+2	151	49	21.7	9	GEST.HT	R	10	1	GEST.HT	2.6	1	10.40 MI	VACUM	_	_	2.7	7 / 10	_	_	8.30MIN	2.10MIN
9	23	8273	PRIMI	1/11/2012	39	151	50	22.2		GDM-M	R	8	3	GDM-M	2.9	1	13 HRS	LSCS	MSL	_	2.7	8 / 10	MAS	AD	10.30MIN	2.25MIN
10	22	4979	G2P1L1	2/19/2012	40+1	155	56	24.8	2	_	R	8	3	PP	2.6,2.6	2	29.30MIN	NVD	_	_	2.7	7 / 10	_	_	28.45MIN	45MIN
11	28	2651	G2P1L1	3/8/2012	38+6	159	58	25.7	5	ANAEMIA	R	11.8	4	PROM	2.2	1	4.30MIN	NVD	_	PPH	3.4	8 /10	_	_	3.30MIN	1HR
12	23	60157	PRIMI	2/26/2012	40+1	160	58	22.6		_	R	9.2	2	PP	3,2.9	2	26.23 MIN	LSCS	FD	PROM	3	6 / 10	MSAF	AD	26.23MIN	_
13	23	6161	PRIMI	2/10/2012	39+4	156	60	26.6		_	R	4.3	2	OLIGO	3.5,3.5	2	17.46 MIN	LSCS	FD	__	3	8 / 10	_	_	17.46MIN	_
14	28	1382	PRIMI	3/8/2012	38	159	47	20.8		PRE-ECL	R	9.5	4	PRE_ECL	2.6,2.2	2	20.12 MIN	NVD	_	S INJURY	3	8 / 10	_	_	17.30MIN	2.52MIN
15	32	8636	G2P1L1	2/12/2012	40+2	147	52	26.5	6	_	R	9.8	4	PP	1.8,1.7,1.7	3	26.40MIN	NVD	_	_	2.5	6 / 10	RD	AD	25.45MIN	55MIN
16	28	5606	PRIMI	4/11/2012	38	150	58	25.7		GDM-INS	R	9.8	1	GDM-INS	3.5	1	25.40MIN	LSCS	CPD	_	3.5	8 /10	_	_	25.40MIN	_
17	23	7364	PRIMI	5/2/2012	34	159	60	26.6		ANAEMIA	R	2	2	PROM	3.3	1	6.15MIN	LSCS	FD	_	1.72	7 / 10	RDS	AD	6.15MIN	_
18	23	1779	PRIMI	3/10/2012	40+2	160	60	23.4		ANAEMIA	R	8	2	PP	3,2.9,2.9	3	46.30MIN	LSCS	FINDUCTN	_	3.1	8 /10	_	_	46.30MIN	_
19	26	4995	PRIMI	3/22/2012	40+2	138	43	22.6		_	R	9	2	PP	3.1,3.1	2	22 HRS	LSCS	FINDUCTN	_	2.5	6/ 10	RD	AD	22HRS	_
20	26	5291	G3P2L1	3/18/2012	39+5	158	52	23.1	2	_	R	5	3	OLIGO	2.6	1	15.38MIN	NVD	_	_	3.6	8 /10	_	_	14HRS	1.38MIN
21	31	6434	PRIMI	3/22/2012	38	146	47	23.9		_	R	7	4	PROM	2.7,2.7	2	15.21MIN	LSCS	PDECENT	_	2.8	8 / 10	_	_	11.15MIN	4.6MIN
22	23	3446	PRIMI	3/27/2012	40	152	50	22.2		EPILEPTIC	R	5	4	OLIGO	2.7	1	7.32 MIN	LSCS	MSL	_	2.7	8 / 10	MSAF	AD	6.54MIN	40MIN
23	21	1380	PRIMI	3/14/2012	41	157	55	24.4		_	R	8.4	4	PP	2.6	1	9.45	NVD	_	_	2.5	8 / 10	_	_	7HRS	2.45MIN
24	29	8007	G3P1LIA1	3/8/2012	40+1	153	60	26.6	2	_	R	10	3	PP	2.4	1	5.43 MIN	NVD	_	_	3	8 / 10	_	_	4.30MIN	1.13MIN
25	29	7129	G3P1LIA1	3/12/2012	39+5	140	56	28.5	5	GEST.HT	R	8	4	GEST.HT	2.6	1	13.25 MIN	NVD	_	_	2.5	7 / 10	_	_	12.15MIN	1.10MIN
26	27	4384	G2P1L1	4/12/2012	39	152	52	23.1	3	PRE-ECL	R	12	4	PRE_ECL	2.4	1	6.38 MIN	NVD	_	PPH	2.6	8 / 10	_	_	5HRS	1.38MIN
27	26	40460	PRIMI	4/17/2012	37+5	156	60	26.6		_	R	6	1	PROM	3.4	1	7.8 MIN	LSCS	FD	_	2.8	8 / 10	RD	AD	7.8MIN	_
28	30	5774	PRIMI	4/5/2012	39+5	146	47	23.9		GDM-M	R	8	4	GDM-M	2.4	1	10.11MIN	NVD	_	_	3	8 / 10	_	_	6.45MIN	3.26MIN
29	24	8610	G2P1L1	4/8/2012	40+4	153	49	21.7	3	_	R	11	4	PP	2	1	2.45 MIN	NVD	_	_	2.7	7 / 10	_	_	2HRS	45MIN
30	28	30730	PRIMI	4/26/2012	38+2	157	60	26.6		PRE-ECL	R	7	2	PRE_ECL	2.9	1	6.22 MIN	LSCS	PRE-ECL	PPH	3	8 / 10	_	_	6.22MIN	
31	33	7584	G2P1L0	5/23/2012	40	149	56	28.5		_	R	8	3	OD	2.6,2.5	2	14.35 MIN	NVD	_	_	3.2	8 /10	_	_	12.35MIN	2HRS
32	24	8958	PRIMI	5/20/2012	41+1	150	50	22.5		_	R	9	4	PP	2.4	1	8.38 MIN	NVD	_	_	2.75	7 /10	_	_	7.30MIN	1.8MIN

33	24	2641	G2P1L1	4/10/2012	41+1	153	52	23.7	3	ANAEMIA	R	10	4	PP	2.6	1	8.55 MIN	FORCEPS	_	_	2.85	8 /10	RD	AD	7.30MIN	1.25MIN
34	26	5289	G2A1	5/21/2012	38+4	155	60	26.6		_	R	5	3	OLIGO	2.7	1	6.20 MIN	LSCS	FD	_	2.75	8 / 10	TTN	AD	6.20MIN	_
35	23	1329	G2A1	5/12/2012	39+3	159	61	27.1		_	R	4.5	3	OLIGO	2.7,2.7	2	15.30 MIN	LSCS	FINDUCTN	_	2.61	7 /10	_	_	15.30MIN	_
36	28	7177	G4P1L1A2	5/29/2012	38+2	154	51	22.6	5	GDM-INS	R	8.8	4	GDM-INS	2.6	1	7.31 MIN	NVD	_	_	3.25	7 /10	_	_	7HRS	31MIN
37	25	1139	G3P2L1	5/21/2012	39+5	157	54	24	6	PRE-ECL	R	10.5	1	PRE_ECL	2.9,2.9.2.8	3	55.25 MIN	LSCS	FINDUCTN	_	2.4	8/10	_	_	55.25MIN	_
38	32	30485	PRIMI	5/27/2012	38+4	148	53	27		DM-INS	R	12	2	DM-INS	3.3,3.3	2	23.45 MIN	LSCS	FINDUCTN	_	2.7	8 / 10	_	_	23.45MIN	_
39	22	3249	G2A1	5/9/2012	40	157	58	25.7		_	R	7	4	OD	2.7,2.7	2	23.25 MIN	LSCS	NONPROG	_	3.5	8 / 10	_	_	22.25MIN	1.10MIN
40	27	NGO	PRIMI	5/17/2012	39	152	58	25.7		GDM-M	R	8	3	GDM-M	2.7	1	10 HRS	LSCS	FVENTOSE	PPH	3.4	8 /10	_		7HRS	3HRS
41	27	7381	G2P1L1	6/13/2012	40+2	155	52	23.1	7	_	R	5	1	OLIGO	3.2	3	24.12 MIN	LSCS	FINDUCTN	_	2.75	7 /10	_	_-	24.12MIN	_
42	23	4171	PRIMI	1/30/2012	40+1	149	56	28.5		_	R	8	2	PP	3,2.9	2	14.53MIN	LSCS	FD	_	3.7	8 / 10	_	_	14.53MIN	_
43	26	2673	G2P1L1	1/17/2013	40+1	156	52	23.1	3	_	R	7	4	PP	2.6	1	12.20MIN	NVD	_	_	3.1	8 / 10	_	_	11HRS	1.20MIN
44	22	4693	PRIMI	2/12/2013	40+1	149	59	30		_	R	8	0	PP	3.3,3.3,3.3	3	41HRS	LSCS	FINDUCTN	_	3.7	8 / 10	_	_	41HRS	_
45	26	2744	G2P1L1	2/13/2013	40	160	58	23.2	2	_	R	8.2	4	OD	2.4	1	9HRS	NVD	_	_	3.1	8 / 10	_	_	7HRS	2HRS
46	22	2748	G2A1	2/12/2013	39	159	51	22.6		PRE-ECL	R	8.5	3	PRE_ECL	2.6	1	12HRS	NVD	_	_	2.8	8 / 10	_	_	10HRS	2HRS
47	24	2679	G3P1L1A1	2/25/2013	38	160	60	26.5	2	GDM-INS	R	9	4	GDMINS	2.6	1	14HRS	NVD	_	_	3	8 / 10	_	_	12HRS	2HRS
48	22	6514	PRIMI	7/18/2012	40+1	159	56	24.5		_	R	7	4	PP	2.6	1	17.36MIN	FORCEPS	_	CPT	2.7	7 / 10	_	_	10.35MIN	7.1MIN
49	27	6127	G2A1	7/17/2012	40	153	53	23.5		ANAEMIA	R	9	3	OD	2.6,2.4,2.4	3	29.5 MIN	NVD	_	_	2.75	8 /10	_	_	26.15MIN	2.50MIN
50	25	5409	PRIMI	7/18/2012	40	153	62	27.5		_	R	7	1	OD	3.1,3,3	3	24HRS	LSCS	FINDUCTN	_	3.3	8 /10	HYDROCEPHALUS		24HRS	_
51	28	2563	PRIMI	7/17/2012	39+2	150	53	23.5		GDMINS	R	8	3	GDM-INS	2.6,2.5,2.5	3	36.40MIN	VACUM	_	_	3	8 /10	_	_	34.20MIN	2.20MIN
52	26	7391	PRIMI	7/26/2012	40+4	153	62	27.5			R	10	4	PP	2.6	1	10.3MIN	VACUM	_	PPH	3.07	8 /10	_	_	5HRS	5.30MIN
53	24	4495	PRIMI	8/3/2012	38	152	46	20.4		_	R	7	3	PROM	2.6,2.5	2	17HRS	NVD	_	_	2.65	7 /10	_	_	14HRS	3HRS
54	23	6826	PRIMI	8/23/2012	40	160	59	23.4		RH-VE	R	7.6	4	RH -VE	2.6	1	14.10MIN	FORCEPS	_	_	2.7	8 /10	_	_	12HRS	2.10MIN
55	29	8822	PRIMI	9/1/2012	40+2	154	59	26.2		GDM-M	R	9	0	PP	3.4,3.3,3.3	3	32.20MIN	LSCS	FINDUCTN	_	2.8	8 /10	_	_	32.20MIN	_
56	28	20910	G2A1	9/6/2012	40+1	149	47	23.9		_	R	9	4	PP	2.7,2.7,2.7	3	46.30MIN	LSCS	FINDUCTN	_	3.6	8 /10	MSAF	_	46.30MIN	_
57	28	4045	PRIMI	9/21/2012	38	151	60	26.6		_	R	4	0	OLIGO	3.1,3,2.9	3	48HRS	LSCS	FINDUCTN	_	3.2	8/10	_	_	48HRS	
58	26	3110	PRIMI	9/27/2012	40+1	155	59	26.8		_	R	8	2	PP	2.6,2.4	2	21.45MIN	NVD	_	_	3	8 /10	_	_	17HRS	4.45MIN
59	32	6613	G3P1LIA1	9/25/2012	39+4	147	53	27.4	3	PRE-ECL	R	8	3	PRE_ECL	2.6,2.6	2	13HRS	NVD	_	_	3.1	8 /10	_	_	10HRS	3HRS
60	26	1292	PRIMI	9/27/2012	38+4	149	45	22.9		_	R	8	4	PROM	2	1	5 HRS	NVD	_	_	2.8	8/10	_	_	4HRS	1HR
61	23	1719	G2P1L1	9/21/2012	39+5	157	54	24	2	PRE-ECL	R	8	4	PRE_ECL	2.6,2.6	2	33.49MIN	NVD	_	PPH	2.9	8 /10	_	_	31HRS	2.49MIN
62	24	4707	PRIMI	10/12/2012	39+3	158	56	24.8		HYPOTHY	R	8	4	GDM-M	2.4,2.3	2	29.10MIN	NVD	_	_	3.3	8 /10	_	_	25HRS	4.10MIN
63	28	1177	PRIMI	10/23/2012	40+3	153	60	26		_	R	7	2	PP	3,2.9,2.8	3	25.40MIN	LSCS	FINDUCTN	_	3.2	7 /10	MSAF	_	24HRS	1.45MIN
64	24	8270	PRIMI	10/17/2012	40+3	159	55	24.4		_	R	7.7	1	PP	3	2	33.8 MIN	LSCS	FINDUCTN	_	3.3	8 /10	_	_	33.8MIN	_
65	27	2449	G2P1L1	11/1/2012	40+3	159	56	24.8	2	_	R	9.5	4	PP	2.6	1	6 HRS	NVD	_	_	3	8 /10	_	_	4HRS	2HRS

66	27	9809	G2A1	12/8/2012	40	160	55	21.4		_	R	1 1	1	OD	2.7	2	23 HRS	LSCS	FD	_	3.6	8/10	_	_	21HRS	2HRS
67	22	2035	G2A1	1/9/2012	39+5	150	53	23.5		GEST.HT	R	8.7	4	GEST.HT	2.7	2	20.20 MIN	LSCS	FD	_	2.8	6 /10	MSAF	AD	18.30MIN	1.50MIN
68	22	2223	PRIMI	12/5/2012	39	149	46	23.4		ANAEMIA	R	10	2	GDM-M	3	1	28.40MIN	LSCS	FD	_	2.75	8 /10	_	_	28.40MIN	_
69	32	609	PRIMI	1/26/2013	39+5	156	59	26.2		GDM-M	R	11	3	GDM_M	2.8	1	5.32MIN	LSCS	PPREVIA	_	3.4	8 /10	_	_	5.32MIN	_
70	23	3109	PRIMI	1/4/2013	40	160	68	26.5		HYPOTHY	R	9	4	OD	2.6,2.6	2	13.10MIN	NVD	_	MAN R OF PLACENTA	2.7	8 /10	_	_	11.45MIN	1.25MIN
71	25	1479	PRIMI	3/4/2013	40	143	64	32.6		ANAEMIA	R	8	3	OD	2.9	1	11.40MIN	LSCS	FD	_	3.3	7 / 10	_	_	10.26MIN	1.14MIN
72	26	3333	G2P1L1	2/20/2013	39+3	157	56	24.8	4	_	R	5	4	PROM	2.4	1	5.30MIN	NVD	_	_	2.7	8 / 10	_	_	4.40MIN	40MIN
73	22	8555	PRIMI	3/9/2013	38+2	156	63	28		HYPOTHY	R	7	2	IUGR	2.9,2.9	2	32.30MIN	LSCS	FD	_	2.4	7 / 10	IUGR	RD	32.30MIN	_
74	20	9957	PRIMI	3/21/2013	40+1	161	63	24.6		_	R	9	3	PP	2.8,2.7	2	29.15MIN	LSCS	FD	_	3.4	8/10	MSAF	_	26.15MIN	3.30MIN
75	24	40870	PRIMI	3/7/2013	40	150	53	23.5		_	R	11	2	OD	3.2	1	6.30MIN	LSCS	FD	_	3	8 / 10	_	_	6.25MIN	_
76	21	2627	PRIMI	3/1/2013	40+4	157	60	26.6		_	R	8	3	PP	2.8,2.9	2	11.30MIN	LSCS	FD	_	3	8 / 10	_	_	11.30MIN	_
77	26	5580	PRIMI	3/13/2013	40	152	76	33.6		GEST.HT	R	8	2	GEST.HT	2.6,2.6,2.2	3	72HRS	NVD	_	MAN R OF PLACENTA	2.7	8 / 10	_	_	69HRS	3HRS
78	24	2455	PRIMI	3/3/2013	40+4	146	56	28.5		HBSAG+	R	8	2	PP	3.1,3,3	3	48.14MIN	LSCS	FINDUCTN	_	2.9	8 / 10	_	AD	48.14MIN	_
79	32	7387	PRIMI	3/23/2013	40	158	60	26.6		_	R	10	1	OD	3.2,3.1,3.1	3	48.30MIN	LSCS	FINDUCTN	_	3.3	7 / 10	TTN	_	48.30MIN	_
80	22	3718	PRIMI	3/7/2013	40+1	160	62	24.4		_	R	9	4	PP	2.5,2.4	2	26HRS	NVD	_	_	2.9	7 /10	_	_	25HRS	1HR
81	26	8565	PRIMI	3/26/2013	40+1	148	60	30.6		_	R	8	2	PP	2.9	1	7.45MIN	LSCS	FD	_	2.8	8 / 10	MSAF	_	7.45MIN	_
82	23	2031	PRIMI	3/3/2013	40+3	156	60	26.6		_	R	11	2	PP	2.6,2.5	2	18.50MIN	VACUM	_	_	3	8 /10	HIE	HIE	17HRS	1.50MIN
83	30	8044	PRIMI	4/26/2012	40+1	156	60	26.6		_	R	12	1	PP	3.2,3.2,3.2	3	48.14MIN	LSCS	FINDUCTN	PPH	3.6	8 / 10	_	_	48.14MIN	_
84	29	8747	PRIMI	5/6/2013	40	156	53	23.5		_	R	6	2	OD	2.6,2.5	3	25.15MIN	FORCEPS	_	_	2.8	8 / 10	RD	_	17.30MIN	7.45MIN
85	27	8167	PRIMI	5/27/2013	37+5	144	45	22.9		_	R	7	4	PROM	2.6	1	4.15MIN	VACUM	_	__	2.7	8 / 10	_	_	2HRS	2.15MIN
86	23	5293	PRIMI	5/15/2013	41+1	159	49	21.7		_	R	7	3	PP	2.4	1	10.32MIN	NVD	_	_	2.6	8 /10	_	_	9.45MIN	47MIN
87	24	10036	PRIMI	6/5/2013	38	154	59	26.6		PRE-ECL	R	16	2	PRE_ECL	3.2,2.9,2.9	3	46.15MIN	LSCS	FINDUCTN	_	3.2	7 / 10	_	_	46.15MIN	_
88	28	5572	G4P1L1A2	5/27/2013	39+2	156	52	23.1	2	GDM-M	R	6	2	GDM-M	2.2	1	12.10MIN	NVD	_	_	3.3	8 / 10	_	_	9.30MIN	2.40MIN
89	26	5679	G3P2L2	5/21/2013	39+6	159	53	23.5	3	GDM-M	R	8	4	GDM-M	2.6,2.6	2	16.30MIN	NVD	_	_	2.9	8 / 10	_	_	14.30MIN	2HRS
90	30	8699	PRIMI	5/23/2013	39+5	153	57	25.3		GEST.HT	R	8	0	GEST.HT	3.2,3.1,3.1	3	72HRS	LSCS	FINDUCTN	_	3.4	8 / 10	MSAF	_	72HRS	_
91	29	8797	PRIMI	5/25/2013	39+3	144	56	28.5		_	R	9	3	PROM	2.8,2.7	2	20.50MIN	LSCS	FD	_	2.9	9 / 10	_	_	20.50MIN	_
92	28	9094	PRIMI	5/23/2013	37+5	155	58	25.7		_	R	10	1	PROM	2.6,2.5,2.5	3	46.51MIN	VACUM	_	_	3	7 / 10	_	_	44MIN	2.51MIN
93	34	3064	PRIMI	5/25/2013	38+5	157	59	26.2		PRE-ECL	R	6	3	PRE_ECL	2.9	1	9.45MIN	LSCS	FD	_	3.5	8 / 10	_	_	9.45MIN	_
94	25	8489	G2A1	5/1/2013	40+4	152	53	23.5		_	R	9	4	PP	3	1	8HRS	LSCS	FD	_	2.5	7 / 10	MSAF	_	8HRS	_
95	24	8851	PRIMI	5/10/2013	38+6	158	49	21.7		_	R	6	4	OLIGO	2.4	1	3.56MIN	VACUM	_	_	2.6	7 / 10	_	_	3HRS	56MIN
96	28	6621	PRIMI	5/21/2013	40	146	82	41.8		GDM-M	R	9	2	GDM-M	3.3,3.3,3.3	3	72HRS	LSCS	FINDUCTN	_	3.7	7 / 10	_	_	72HRS	_
97	26	6717	G2A1	8/22/2013	38	153	49	21.7		_	R	4	3	OLIGO	2	1	9.52MIN	NVD	_	_	2.5	8 / 10	_	_	7HRS	2.52MIN
98	22	5378	PRIMI	5/25/2013	40	152	68	30.2		RH-VE	R	6	2	RH-VE	3.1,3,3	3	73.11MIN	LSCS	FINDUCTN	_	2.5	8 / 10	_	_	72.11MIN	_
99	24	5342	G2P1L1	5/24/2013	40+1	151	55	24.4	4	RH-VE	R	7	4	RH-VE	2.4	1	8.15MIN	NVD	_	_	2.8	9 / 10	_	_	6HRS	2.15MIN

100	24	6398	PRIMI	6/12/2013	39+5	160	70	28		HYPOTHY	R	6	4	OLIGO	2.4	1	6.46MIN	VACUM	_	_	2.5	8 / 10	MSAF	_	5.10MIN	1.36MIN
101	28	3410	PRIMI	6 / 7/2013	38+6	156	59	26.2		_	R	7	3	PROM	3	1	18HRS	LSCS	FD	_	3.2	8 /10	_	_	18HRS	_
102	24	8719	PRIMI	6/27/2013	39+1	152	72	32		_	R	9	3	PROM	2.7,2.7	2	15.47MIN	LSCS	FINDUCTN	_	3	8 / 10	IUGR	AD	15.47MIN	
103	30	3798	PRIMI	6/22/2013	39+6	150	64	28.4		_	R	5	2	OLIGO	3,3,3	3	47.25MIN	LSCS	FINDUCTN	_	3.2	8 / 10	RD	_	47.25MIN	_
104	25	1720	PRIMI	6/8/2013	40	156	78	34.6		_	R	5	3	OLIGO	2.6,2.5	2	24.20MIN	NVD	_	_	2.5	8 / 10	_	_	23HRS	1.20MIN
105	23	50955	PRIMI	25 / 6/2013	40+1	151	54	24		_	R	7	1	PP	3.2,3.1, 3.1	3	17HRS	LSCS	FD	_	4	8 / 10	RD	AD	16HRS	1HR
106	26	3753	PRIMI	6/30/2013	39+5	145	49	25		HYPOTHY	R	4	3	PROM	2.8,2.8	2	10.18MIN	LSCS	FD	_	3.1	8 / 10	_	_	10.18MIN	_
107	23	9254	PRIMI	7/17/2013	36+3	152	60	26.6		_	R	7	2	PROM	3.2	1	15.10MIN	LSCS	FD	_	2.8	8 / 10	PERINATAL	HYPOXIA	15.15MIN	_
108	23	1284	PRIMI	6/26/2013	40+1	159	50	22.2		_	R	8	3	PP	2.6,2.6, 2.5	3	31.20MIN	NVD	_	_	3.3	8 / 10	_	_	28HRS	3.20MIN
109	24	9043	PRIMI	6/17/2013	40	157	49	21.2		_	R	7	4	OD	2.6	1	7.21MIN	NVD	_	_	2.9	8 / 10	_	_	6HRS	1.21MIN
110	24	2396	G2P1L1	6/11/2013	40	158	51	22.6	2	_	R	9	4	OD	2.4	1	10HRS	VACUM	_	_	2.5	8 / 10	IUGR	AD	8.30MIN	1.30MIN
111	22	90882	PRIMI	6/6/2013	40	156	62	27.5		_	R	6	3	OD	2.6,2.5	2	32.25MIN	FORCEPS	_	_	2.9	7 / 10	_	_	28.15MIN	4.10MIN
112	19	40496	PRIMI	6/20/2013	40+1	156	60	26.6		_	R	9	4	PP	2.6,2.6	2	21.30MIN	VACUM	_	_	3.35	8 / 10	_	_	19HRS	2.30MIN
113	26	7071	G2P1L1	6/17/2013	39+6	153	60	26.6	8	_	R	12	3	PROM	2.9	1	19.38MIN	LSCS	FD	_	3.4	8 / 10	MSAF	_	19.38MIN	_
114	25	8881	PRIMI	6/1/2013	39+6	156	59	26.2		GEST.HT	R	7	2	GEST.HT	2.9	1	17.15MIN	LSCS	FD	_	3.4	8 / 10	_	_	17.15MIN	_
115	21	1962	PRIMI	6/27/2013	39	152	60	26.6		_	R	6	2	PROM	3	1	6HRS	LSCS	FINDUCTN	_	2.4	8 / 10	FD	_	6HRS	_
116	20	8626	PRIMI	7/11/2013	40+1	159	60	26.6		_	R	9	1	PP	3.2,3.1, 3.1	3	51.31MIN	LSCS	FD	_	3.2	8 / 10	MSAF	AD	51.35MIN	_
117	25	5063	PRIMI	6/28/2013	38	158	63	28		GDM-INS	R	12	1	GDMINS	3.1,3.1	2	18.41MIN	LSCS	FD	_	2.9	8 / 10	IDM	AD	18.14MIN	_
118	35	8741	G4P1L0A2	6/12/2013	39+5	157	70	31.1		GDM-M	R	11	3	GDM-M	2.6,2.4	2	15.40MIN	NVD	_	_	3.3	7 / 10	_	_	14HRS	1.40MIN
119	35	9476	G4P1L1A2	7/8/2013	38+1	152	64	28.4	10	GDM-INS	R	9	4	GDMINS	2.6,2.6, 2.5	3	25HRS	NVD	_	_	2.8	8 / 10	_	_	24HRS	1HR
120	22	1383	G3P1LIA1	6/13/2013	40+1	156	60	26	3	_	R	8	4	PP	2.3	1	8 HRS	NVD	_	_	3	8 / 10	_	_	7.35MIN	25MIN
121	22	3107	G2P1L1	7/5/2013	40	151	47	20.6	2	_	R	10	3	OD	2.4	1	8.55MIN	NVD	_	_	2.9	8 / 10	_	_	8.30MIN	25MIN
122	19	4059	PRIMI	7/16/2013	40	154	67	29.7		_	R	9	3	OD	2.6,2.5	2	21.23MIN	NVD	_	_	2.9	8 / 10	_	_	20.10MIN	1.1MIN
123	20	8626	PRIMI	7/11/2013	40+1	152	59	26.2		ANAEMIA	R	9	1	PP	3.2,3.1, 3.1	3	50.30MIN	LSCS	FINDUCTN	_	3.2	8 / 10	RD	AD	50.30MIN	_
124	28	5138	PRIMI	7/22/2013	39+3	169	99	30.52		GDM-M	R	11	1	GDM-M	3.2,3.2, 3.2	3	34.53MIN	LSCS	FINDUCTN	_	3.2	8 / 10	_	_	34.53MIN	_
125	22	5648	PRIMI	7/22/2013	39+2	153	49	21.7		_	R	7	3	OLIGO	2.6	1	18HRS	NVD	_	_	2.8	8 / 10	_	_	14HRS	4HRS
126	27	8997	PRIMI	7/27/2013	38+1	152	55	21.6		_	R	8	4	PROM	2.4	1	8HRS	NVD	_	_	3	8 / 10	_	_	6.20MIN	1.40MIN
127	25	5108	PRIMI	7/26/2013	38+3	165	52	20		HBSAG+	R	5	4	OLIGO	2.3	1	8.40MIN	NVD	_	_	2.8	8 / 10	_		6.30MIN	2.10MIN
128	18	7765	PRIMI	7/17/2013	39+3	144	40	18.2		_	R	9	4	PROM	2.4	1	11.8MIN	NVD	_	_	2.4	8 / 10	_	_	9.30MIN	1.38MIN
129	28	8868	G2P1L1	7/13/2013	38+6	149	51	22.9	2	GDM-M	R	7	4	GDM-M	2.6	1	6.45MIN	NVD	_	_	2.7	8 / 10			6.30MIN	15MIN
130	24	6456	PRIMI	7/19/2013	40+1	157	64	28.4		_	R	9	4	PP	2.6,2.5	2	23.25	NVD	_	_	3.2	8 / 10	_	_	18.35MIN	4.50MIN
131	20	2253	PRIMI	7/27/2013	39	153	62	26.4		PRE-ECL	R	8	4	PRE_ECL	2.6,2.5	2	12.10MIN	NVD	_	_	2.4	8 / 10	IUGR	AD	11HRS	1.15MIN
132	28	80893	PRIMI	7/18/2013	40	158	72	28.9		_	R	11.8	3	OD	2.6	1	8.45	FORCEPS	_	_	2.8	8 / 10	MSAF	AD	8HRS	46MIN
133	26	2573	G2P1L1	7/22/2013	39+5	163	54	21	3	_	R	4	3	OLIGO	2.6,2.5	2	15.26MIN	NVD	_	_	3	8 / 10	_	_	12HRS	3.26MIN
134	27	5399	PRIMI	7/26/2013	40+1	166	66	19		_	R	3	3	OD	2.6,2.5	2	13.3MIN	NVD	_	_	2.9	8 / 10	_	_	11.15MIN	1.48MIN
135	27	8644	PRIMI	8/1/2013	39+6	154	53	23.5		_	R	6	3	OLIGO	2.6	1	18.50MIN	NVD	_	_	2.6	8 / 10	MSAF	AD	16HRS	2.50MIN

136	29	20117	PRIMI	7/24/2013	40	163	65	25.9		_	R	7	3	OD	2.5	1	26HRS	VACUM	_	_	3.2	8 / 10	HIE	AD	22.45MIN	3.15MIN
137	27	6645	PRIMI	9/19/2013	38+3	148	51	26		GDM-INS	R	12	4	GDMINS	2.6	1	10HRS	NVD	_	_	2.8	8 / 10	IDM	AD	8HRS	2HRS
138	33	7012	PRIMI	8/22/2013	40	156	70	28.6		GDM-NS	R	10	1	GDMINS	3.1,3	2	46.10MIN	LSCS	FD	_	3.3	8 / 10	IDM	AD	46.10MIN	_
139	21	7044	PRIMI	8/21/2013	40+1	150	49	21.7		_	R	12	3	PP	2.8	1	7HRS	LSCS	FD	_	3.2	8 / 10	HIE	AD	7HRS	_
140	27	5053	G2A1	8/12/2013	39+3	150	70	27.5		GEST.HT	R	12	3	GEST.HT	2.7	1	8.16MIN	LSCS	FD	PPH	3.7	8 / 10	_	_	6.15MIN	2.1MIN
141	23	9282	PRIMI	8/20/2013	40+1	152	45	20		_	R	9	3	PP	2.6,2.5	2	20.5MIN	NVD	_	_	2.9	8 / 10	_	_	18HRS	2.5MIN
142	21	3138	PRIMI	8/13/2013	39+2	161	61	19.3		GDM-M	R	8.8	4	GDM_M	2.5,2.4	2	11.30MIN	NVD	_	MROP	3.4	8 / 10	_		10HRS	1.30MIN
143	26	2502	PRIMI	8/16/2013	40+1	149	55	22.52		_	R	8	3	PP	2.6,2.6	2	26.41MIN	NVD	_	_	3	8 / 10	_	_	24HRS	2.41MIN
144	26	2919	G3P1LIA1	8/21/2013	38	161	71	27.7	3	GDM-INS	R	9.5	4	GDMINS	2.2	1	7HRS	NVD	_	_	3.1	7 / 10	_	_	6.45MIN	15MIN
145	25	1812	PRIMI	9/4/2013	40	151	52	23.1		_	R	8.8	2	PP	2.6,2.5	2	30.37MIN	FORCEPS	_	_	2.4	7 / 10	IUGR	AD	26.30MIN	4.7MIN
146	24	5829	G3P1LIA1	9/15/2013	40+2	164	64	25		_	R	9	3	PP	2.4	1	9.15MIN	NVD	_	_	2.7	8 / 10	MSAF	AD	8HRS	1.15MIN
147	24	7357	G3A2	9/12/2013	40	153	48	21.3		_	R	6	4	OD	2.5,2.	2	22.10MIN	VACUM	_	_	3.1	7 / 10	_	_	19.30MIN	2.40MIN
148	28	8768	PRIMI	9/17/2013	38	155	52	23.1		GDM-INS	R	10	3	GDMINS	2.6,2.5	2	20.30MIN	VACUM	_	PPH	2.7	8 / 10	_	_	16.3OMIN	4HRS
149	29	1506	PRIMI	9/15/2013	39+4	150	54	24		_	R	5	3	OLIGO	2.7,2.6	2	19.10MIN	LSCS	FD	_	2.8	6 / 10	MSAF	AD	18HRS	55MIN
150	24	6984	G2P1L1	9/21/2013	40+3	154	45	20		_	R	8	3	PP	2.6,2.4	2	11.30MIN	NVD	_	_	3.2	8 / 10	_	_	9HRS	2.30MIN
151	28	8319	PRIMI	10/1/2013	39+3	149	46	23.4		GDM-M	R	7.5	4	GDM-M	2	1	8HRS	NVD	_	_	3	8 / 10	IDM	AD	6.50MIN	1.15MIN
152	26	6372	PRIMI	10/12/2013	38	153	71	31.5		_	R	8.6	2	PROM	2.9,2.7	2	13.10MIN	LSCS	FD	_	2.8	8 / 10	_	_	13.10MIN	_
153	21	4528	PRIMI	9/29/2013	38+5	154	54	24		GDM-M	R	7.4	4	GDM-M	2.6	1	5.14MIN	NVD	_	_	2.8	8 / 10	_	_	4HRS	1.14MIN
154	22	7363	PRIMI	9/27/2013	40	147	45	20.8		_	R	8	4	OD	2.8,2.8,2.8	3	36.30MIN	LSCS	FINDUCTN	_	3.7	8 / 10	_	_	36.30MIN	_
155	24	2550	PRIMI	10/1/2013	40	160	65	25		_	R	8	4	OD	2.6	1	14.20MIN	VACUM	_	_	3.2	8 / 10	_	_	11HRS	3.20MIN
156	26	6628	G2P1L1	10/27/2013	40+2	164	63	24.6		SCTRAIT	R	16	4	PP	2.4	1	14.45MIN	NVD	_	_	3.7	8 / 10	MSAF	_	13HRS	1.45MIN
157	26	9693	PRIMI	10/13/2013	40	166	59	23		_	R	8	1	OD	2.6	1	14.22MIN	NVD	_	_	3.1	8 / 10	_	_	13HRS	1.22MIN
158	24	3083	PRIMI	10/29/2013	38+3	154	60	26.6		GDM-INS	R	9.8	0	GDMINS	3.3,3.3,3.3	3	26HRS	LSCS	FINDUCTN	_	3.6	8 / 10	IDM	AD	26HRS	_
159	29	6937	PRIMI	17/10/20133	40+1	149	45	22.9		_	R	12	3	PP	2.7	1	12.30MIN	LSCS	FD	_	3	8 / 10	TTN	AD	12.30MIN	_
160	32	100851	PRIMI	11/2/2013	38+4	159	60	26.6		PRE-ECL	R	3.5	0	OLIGO	3.5,3.5,3.5	3	19.15MIN	LSCS	FINDUCTN	_	2.4	8 / 10	RD	AD	19.15MIN	_
161	20	2725	G2A1	10/18/2013	40	156	54	24		ANAEMIA	R	12	2	OD	2.6,2.5,2.5	2	22.19MIN	NVD	_	_	2.7	8 / 10	_	_	20HRS	2.19MIN
162	24	1175	PRIMI	11/3/2013	38	159	40	17.7		_	R	4.5	2	OLIGO	3.1,3.1,3.1	3	23.45MIN	LSCS	FINDUCTN	_	2.6	8 / 10	_	_	23.45MIN	_
163	29	5533	PRIMI	10/12/2013	40+1	162	59	23		_	R	6	2	PP	2	2	11.5MIN	NVD	_	_	2.7	8 / 10	_	_	10HRS	1.5MIN
164	30	3906	G2P1L1	10/21/2013	38+6	158	53	23.5		_	R	8.9	2	PROM	2.6,2.4	2	11HRS	NVD	_	_	2.9	8 / 10	_	_	9.30MIN	1.30MIN
165	35	1225	PRIMI	9/17/2013	39+1	158	102	45.3		GEST.HT	R	12	3	GEST.HT	2.8	1	3.30MIN	LSCS	FD	_	2.5	8 / 10	_	_	3.30MIN	_
166	25	2978	PRIMI	10/18/2013	39+6	169	52	20.3		_	R	10	3	PROM	2.7	1	18HRS	LSCS	PDECENT	_	3.4	8 / 10	_	_	14HRS	4HRS
167	25	3156	G3P1L1A1	10/14/2013	40+1	157	51	22.6	3	_	R	7	3	PP	2.1	1	2.30MIN	NVD	_	_	3.2	8 / 10	_	_	1.50MIN	40MIN
168	26	500583	PRIMI	10/10/2013	40	153	46	20.4		_	R	4.5	2	OLIGO	3.2,3.1,3.1	3	29.30MIN	LSCS	FINDUCTN	_	3.1	8 / 10	_	_	29.30MIN	_
169	25	3020	G4P1L1A1	10/13/2013	38+5	149	40	20.4	2	_	R	4	4	OLIGO	2	1	2.11MIN	NVD	_	_	1.9	7 / 10	IUGR	AD	1.40MIN	31MIN

170	30	2144	PRIMI	10/8/2013	39+3	145	42	21.4		GDM-M	R	9	2	GDM-M	3,2.9,2.9	3	24HRS	LSCS	FINDUCTN	_	2.8	8 / 10	_	_	24HRS	_
171	22	7451	PRIMI	10/27/2013	37+1	164	54	21.6		_	R	2	0	PROM	3.1,3.1	2	12HRS	LSCS	FD	_	2.4	8 / 10	IUGR	AD	12HRS	_
172	26	8498	PRIMI	10/31/2013	39	158	49	21.7		_	R	9	4	PROM	2.2	1	3.29MIN	NVD	_	PPH	2.4	8 / 10	_	_	3.10MIN	19MIN
173	26	90578	PRIMI	10/12/2013	39+2	152	40	17.7		GDM-M	R	8	2	GDM-M	2.6,2.5	2	19.25MIN	VACUM	_	_	3	8 / 10	RD	AD	15HRS	3.45MIN
174	31	9201	G4P2L2A1	10/26/2013	39+3	158	49	21.7	2	_	R	5	3	OLIGO	2.6,2.5	2	25.43MIN	NVD	_	_	2.5	8 / 10	_	_	24HRS	1.43MIN
175	26	900370	PRIMI	10/27/2013	40+1	148	48	24.4		_	R	11	2	PP	2.7	1	13HRS	FORCEPS	_	_	2.7	8 / 10	RDS	AD	11HRS	2HRS
176	24	8291	PRIMI	11/5/2013	38+6	154	51	22.6		_	R	5	4	OLIGO	2.7,2.6	2	27.10MIN	LSCS	NPL	_	2.5	8 / 10	_	_	27.10MIN	_
177	32	2152	G2P1L0	10/27/2013	40+1	145	46	23.4		_	R	9.8	4	PP	2.6,2.4	2	25.42MIN	NVD	_	_	2.8	8 / 10	MSAF	AD	24.12MIN	1.30MIN
178	21	8825	PRIMI	11/18/2013	37	144	49	25		_	R	6	4	OLIGO	2.7	1	9.15MIN	LSCS	FD	_	2.3	8 / 10	LBW	AD	9.15MIN	_
179	27	4270	G2P1L1	10/27/2013	40+1	153	63	28	3	_	R	8.4	3	PP	2.5	1	6.10MIN	NVD	_	_	2.7	8 / 10	_	_	5HRS	1.10MIN
180	27	1613	G3P1LIA1	10/22/2013	40+2	153	50	22.2	2	_	R	15	4	PP	2.6	1	8HRS	NVD	_	SDYSTOCIA	3.8	8 / 10	IDM	AD	7HRS	1HR
181	26	2479	PRIMI	10/30/2013	40	150	65	28.8		_	R	4.5	2	PROM	3.2,3.1,3.1	3	23HRS	LSCS	FINDUCTN	_	3.1	8 / 10	_	_	23HRS	_
182	25	9853	PRIMI	11/15/2013	38+2	155	51	22.6		_	R	6	4	PROM	2.4	1	8.15MIN	NVD	_	_	2.7	8 / 10	_	_	7HRS	1.15MIN
183	23	7897	G2P1L0	11/5/2013	39+3	156	49	21.7		_	R	5	3	OLIGO	2.7	1	10.50MIN	VACUM	_	_	2.7	8 / 10	_	_	9HRS	2.50MIN
184	30	2532	PRIMI	11/9/2013	38+3	169	82	32.03		GDM-INS	R	9	4	GDMINS	2.7,2.7,2.7	3	55HRS	LSCS	FD	_	3.9	8 / 10	IDM	AD	55HRS	_
185	24	7474	G3P1L0A1	11/11/2013	40	158	56	24.8		_	R	6	2	OD	3.5,3.4,3.4	3	23.45MIN	LSCS	FINDUCTN	_	3.2	7 / 10	_	_	23.45MIN	
186	32	4517	G3P1L1A1	10/28/2013	40+1	162	65	25.3	10	_	R	14	3	PP	2.7,2.7	2	19.15MIN	LSCS	FD	_	3.1	8 / 10	MSAF	AD	19HRS	_
187	30	1622	PRIMI	11/23/2013	38+4	159	60	26.6		PRE-ECL	R	11	1	PRE_ECL	3.2,3.1,3.1	3	53.45MIN	LSCS	FINDUCTN	_	2.6	8 / 10	IUGR	AD	53.45MIN	_
188	21	2397	PRIMI	11/15/2013	40+2	155	53	23.5		_	R	7	4	PP	2.6.2.2	2	20HRS	FORCEPS	FD	_	3	8 / 10	_	_	16HRS	14HRS
189	22	1360	PRIMI	11/6/2013	38+6	150	59	26.2		GDM-INS	R	13	3	GDMINS	2.7	1	9.50MIN	LSCS	FD	_	3.1	8 /10	MSAF	AD	9.50MIN	_
190	33	3699	PRIMI	11/18/2013	38+2	153	65	28.8		GDM-INS	R	13	3	GDMINS	3.3,3.3,3.3	3	39.45MIN	LSCS	FD	_	3.1	8 / 10	_	_	39.45MIN	_
191	22	300053	PRIMI	11/2/2013	40+3	148	40	18.2		_	R	13	3	PP	3,2.9,2.9	3	57.30MIN	LSCS	PDECENT	_	3.3	8 / 10	_	_	57.30MIN	_
192	23	2117	G4P1L1A2	11/14/2013	39+3	156	51	22.6	4	GDM-INS	R	8	4	GDMINS	2.2	1	6.50MIN	NVD	_	_	2.7	8 / 10	_	_	4.50MIN	2HRS
193	30	3866	PRIMI	11/11/2013	39	149	72	36		GDM-INS	R	9	2	GDMINS	3.2,3.1,3.1	3	26HRS	LSCS	_	_	3	8 / 10	_	_	26HRS	_
194	27	4732	PRIMI	11/5/2013	40	146	42	21.4		RH-VE	R	8	4	RH-VE	2.9,2.8,2.8	3	26HRS	LSCS	FD	_	2.9	8 / 10	MSAF	AD	26HRS	_
195	32	300553	PRIMI	11/15/2013	40	159	48	21.3		_	R	9.8	4	OD	2.3	1	14HRS	VACUM	_	_	2.7	7 / 10	_	_	11HRS	3HRS
196	26	9931	G4P1L1A2	11/13/2013	40+3	147	45	21.75	2	_	R	8	3	PP	1.9	1	6.30MIN	NVD	_	_	3.2	8 / 10	_	_	5.50MIN	45MIN
197	35	8967	PRIMI	11/21/2013	38+4	140	51	26		GDM-INS	R	15	0	GDMINS	3.4	1	8HRS	LSCS	FD	_	3	8 / 10	_	_	8HRS	_
198	25	6983	PRIMI	11/7/2013	40+1	151	71	31.5		RH-VE	R	11	2	RH-VE	2.9,2.9,2.9	3	47.30MIN	LSCS	FINDUCTN	_	3.4	8 / 10	_	_	47.30MIN	_
199	27	8096	PRIMI	11/14/2013	39+3	145	53	27		_	R	4	1	PROM	3.2	1	7.20MIN	LSCS	FD	_	3.5	7 / 10	_	_	7.20MIN	_
200	22	3282	PRIMI	11/12/2012	40	158	50	22.2		_	R	8	3	OD	2.2	1	7.35MIN	NVD	_	_	2.7	8 / 10	_	_	6.20MIN	1.15MIN
201	24	8508	PRIMI	5/4/2012	40	145	52	26.5		_	R	9	0	OD	2.6,2.6	2	23.30MIN	FORCEPS	_	_	2.2	7 / 10	_	_	20.10MIN	3.20MIN
202	22	3460	G2P1L1	6/11/2012	40+1	160	58	22.6	4	_	R	9	0	PP	2.6,2.5,2.5	3	28.7MIN	NVD	_	_	2.7	7 / 10	_	_	26.7MIN	2HRS
203	23	7357	PRIMI	11/25/2012	40+1	140	43	21.9		_	R	7.8	4	PP	2.6,2.4	2	15.50MIN	NVD	_	_	2.7	8 / 10	_	_	12HRS	3.50MIN

204	30	50423	G2E1	11/24/2012	40+2	153	52	23.1		_	R	8	3	PP	3,2.9,2.9	3	65.15MIN	LSCS	FD	_	3.3	8 / 10	_	_	65.15MIN	_
205	23	1317	PRIMI	12/21/2012	36	162	58	22.6		GDM-INS	R	17	4	GDMINS	2.6,2.5	2	12.50MIN	NVD	_	PPH	3.3	8 / 10	_	_	11HRS	1.50MIN
206	25	9209	PRIMI	9/14/2012	40+2	149	47	23.9		_	R	9	0	PP	2.7	1	5.23MIN	LSCS	_	_	3.5	8 / 10	_	_	5.23MIN	_
207	27	7681	G2P1L0	10/4/2012	37+4	143	52	26.5		_	R	3	4	OLIGO	2.7	1	6.35MIN	LSCS	FD	_	3.5	8 / 10	_	_	6.35MIN	_
208	32	4718	G2P1L1	7/12/2012	37+1	157	51	22.6	3	PRE-ECL	R	11	1	PRE_ECL	3.2	1	4.45MIN	LSCS	FD	TSYSTOLE	2.5	8 / 10	_	_	4.45MIN	_
209	30	9655	G2P1L1	8/2/2012	40+4	146	49	25	2	_	R	10	1	PP	3.5,3.4,3.2	3	72HRS	LSCS	PROM	_	2.8	8 / 10	_	_	72HRS	_
210	30	8655	G2P1L1	8/22/2012	40	149	53	27	3	_	R	15	3	OD	1.7	1	7.20MIN	NVD	_	_	3	7 / 10	_	_	6HRS	1.20MIN
211	31	2824	PRIMI	9/4/2012	38+5	152	56	24.8		DM-INS	R	12	3	DM-INS	2.7	1	8HRS	LSCS	FD	_	2.6	8 / 10	_	_	8HRS	_
212	29	5622	G3P1L1A1	8/23/2012	40+2	159	55	24.4	3	_	R	12	1	PP	3.1,3	2	30.28MIN	LSCS	FD	_	3.5	8 / 10	_	_	30.28MIN	_
213	26	5366	PRIMI	6/12/2012	38+6	158	52	23.1		GDM-NS	R	7.9	4	GDMINS	2.8,2.7	2	20.50MIN	LSCS	FD	_	3.6	8 / 10	_	_	20.50MIN	_
214	26	9993	G2P1L1	8/25/2012	40+2	154	51	22.6	4	_	R	7	3	PP	1.5	1	9HRS	NVD	_	_	3	8 / 10	_	_	8.15MIN	45MIN
215	28	9102	G2A1	9/6/2012	40+1	156	54	24		_	R	7	4	PP	2.7	1	46.30MIN	LSCS	FD	_	3.6	8 / 10	_	_	46.30MIN	_
216	29	8822	PRIMI	9/1/2012	40+2	162	68	26.5		GEST.HT	R	12	0	GEST.HT	3.4,3.3,3.3	3	32.17MIN	LSCS	FINDUCTN	_	2.8	8 / 10	_	_	32.17MIN	_
217	28	1177	PRIMI	23/10/2012	40+3	150	51	22.6		_	R	10	3	PP	3,3,3	3	25.4MIN	LSCS	MSL	_	3.2	7 / 10	MSAF	AD	25.4MIN	_
218	23	1719	G2P1L1	10/21/2012	39+5	159	53	23.5	3	PRE-ECL	R	7	4	PRE_ECL	2.4,2.3	2	39.49MIN	NVD	_	_	2.9	8 / 10	_	_	38HRS	1.49MIN
219	24	8218	PRIMI	10/17/2012	40+2	152	55	24.4		_	R	6	2	PP	2.7,2.7	2	29.11MIN	LSCS	MSL	_	3.2	8 / 10	MSAF	AD	29.11MIN	_
220	26	1962	PRIMI	10/11/2012	40	156	119	52.8		PRE-ECL	R	8	3	PRE_ECL	2.4	1	12.27MIN	VACUM	_	_	3.4	7 / 10	_	_	11HRS	1.27MIN
221	30	4168	G2P1L1	11/14/2012	40	153	52	23.1	6	_	R	11	4	OD	2.6	1	7.30MIN	NVD	_	_	2.2	8 / 10	_	_	6.30MIN	1HR
222	21	1315	PRIMI	11/6/2012	38+3	154	50	22.2		_	R	6	3	OLIGO	2.7	1	7HRS	NVD	_	_	2.1	8 / 10	IUGR	AD	6HRS	1HR
223	23	3743	PRIMI	10/10/2012	41+5	157	59	26.2		_	R	9	3	PP	2.5	1	19.10MIN	NVD	_	_	2.9	8 / 10	_	_	18HRS	1.10MIN
224	21	8604	PRIMI	10/26/2012	40	162	59	23		_	R	10	4	OD	2.3,2.3	2	14.10MIN	NVD	_	_	3	8 / 10	_	_	12HRS	2.10MIN
225	24	2533	G3P2L2	10/16/2012	40+3	151	55	24.4	4	_	R	11	3	PP	2.1	1	4.20MIN	NVD	_	_	3.1	8 / 10	_	_	3.30MIN	50MIN
226	34	5112	G4P1L1A2	10/17/2012	40+2	158	49	21.7	7	_	R	9	2	PP	2.7	2	15.10MIN	LSCS	PDECENT	_	2.7	7 / 10	_	_	12HRS	3.10MIN
227	22	1748	G4P2L2A1	10/31/2012	40	156	57	25.3	5	_	R	8	3	OD	2.2,2.2,2.1	3	33.20MIN	NVD	_	_	2.6	8 / 10	_	_	31.20MIN	2HRS
228	23	3173	PRIMI	11/18/2012	40+2	147	52	26.5		_	R	9	4	PP	1.6,1.6	2	26.38MIN	NVD	_	_	2.8	8 / 10	_	_	24.30MIN	2.8MIN
229	26	70429	PRIMI	11/21/2012	40+5	156	59	26.2		_	R	12	4	PP	2.1	1	7.37MIN	LSCS	MSL	_	3.1	8 / 10	_	_	7.37MIN	_
230	26	5996	PRIMI	11/23/2013	39+4	161	60	23.4		_	R	7	1	PROM	3.2	1	3.30MIN	LSCS	FD	_	3.2	8 / 10	_	_	3.30MIN	_
231	29	8030	PRIMI	11/21/2013	40	154	54	24		_	R	8	3	OD	2.3	1	13.15MIN	FORCEPS	_	_	2.75	8 / 10	_	_	10.15MIN	3HRS
232	25	7373	PRIMI	11/15/2013	40+1	150	54	24		_	R	15	2	PP	3.1,3.1,3.1	3	72HRS	LSCS	FINDUCTN	_	3.3	8 / 10	_	_	72HRS	_
233	23	9651	G2P1L1	3/31/2012	40+1	153	51	22.6	2	_	R	4	1	OLIGO	3.2	1	7.30MIN	LSCS	FD	_	3	8 / 10	_	_	7.30MIN	_
234	33	9271	PRIMI	1/1/2013	40+1	159	50	22.2		_	R	9	2	PP	2.6,2.4	2	12HRS	VACUM	_	_	3	8 / 10	_	_	9HRS	3HRS
235	30	8559	G3P2L2	3/11/2013	40+1	160	56	21.8	3	_	R	9	3	PP	2	1	9.24MIN	NVD	_	_	2.3	8 / 10	_	_	8HRS	1.25MIN
236	26	1479	PRIMI	3/2/2013	40+1	162	69	26.9		_	R	8	1	PP	3.2	1	10.44MIN	LSCS	PROM	_	3.3	8 / 10	_	_	10.44MIN	_
237	31	4961	PRIMI	2/23/2013	40+2	158	64	28.4		_	R	9	1	PP	3.2,3.2	2	23.50MIN	LSCS	NPL	_	3.4	8 / 10	_	_	23.50MIN	_
238	25	3056	PRIMI	7/26/2013	40+4	159	52	23.1		_	R	6	4	PP	2.2,2	2	15.30MIN	VACUM	_	_	3	8 / 10	_	_	13HRS	2.30MIN
239	28	1209	G4P1L1A2	12/5/2012	38+6	156	51	22.6	4	GDM-INS	R	9	4	GDMINS	2.3,2.2	2	14.55MIN	NVD	_	_	2.4	8 / 10	_	_	13.25MIN	1.30MIN
240	26	50954	PRIMI	3/18/2012	40+2	161	65	25.3		_	R	7	0	PP	3.4	1	9.15MIN	LSCS	FD	_	3.4	8 / 10	MSAF	AD	9.15MIN	_

241	27	8128	PRIMI	11/8/2012	41+1	148	51	26		_	R	8	0	PP	3.4,3.3, 3.3	3	34.20MIN	LSCS	FINDUCTN	_	3	8 / 10	_	_	34.20MIN	_
242	27	2126	G2P1L1	11/7/2012	40+4	160	62	24.2	2	_	R	6	3	PP	2.4,2.4	2	20HRS	NVD	_	_	2.7	8 / 10	_	_	18HRS	2HRS
243	32	3193	G3A2	6/4/2012	40	152	49	21.7		GDM-INS	R	7	4	GDMINS	2.4	1	19HRS	NVD	_	_	2.4	7 / 10	_	_	17HRS	2HRS
244	29	8734	PRIMI	2/1/2012	40+3	155	65	28.8		_	R	6.3	2	PP	3.1	1	10.50MIN	LSCS	FD	_	2.5	8 / 10	MSAF	AD	10.50MIN	_
245	22	5992	PRIMI	2/2/2012	39+6	149	45	22.9		GDM-M	R	6	2	GDM-M	2.3,2.2	2	20HRS	NVD	_	_	2.6	8 / 10	_	_	18HRS	2HRS
246	30	7818	PRIMI	1/25/2012	41+4	156	59	26.2		_	R	8	2	PP	3.2,3.2, 3.2	3	27.45MIN	LSCS	FD	_	2.8	8 / 10	TTN	AD	27.45MIN	_
247	25	6461	G2P1L1	1/30/2012	40+2	145	49	25	4	_	R	8.3	4	PP	1.9	1	13HRS	NVD	_	_	2.7	8 / 10	_	_	12HRS	1HR
248	27	2557	G2P1L1	12/12/2012	39+3	148	50	25		GDM-M	R	8.2	3	GDM-M	2.5,2.4, 2.4	3	36.30MIN	NVD	_	_	3.7	8 / 10	_	_	34HRS	2.30HRS
249	29	1934	G2A1	12/15/2012	39	151	59	26.2		GDM-INS	R	12	0	GDM-INS	3.2	1	13.15MIN	LSCS	FD	_	3	7 / 10	IDM	AD	13.15MIN	_
250	24	5640	PRIMI	12/5/2012	40+1	153	51	22.6		_	R	9.2	2	PP	3.1,3.1	2	25.40MIN	LSCS	MSL	_	3.7	8 / 10	MSAF	AD	25.40MIN	_